

## **VPDES PERMIT FACT SHEET**

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a minor municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The proposed discharge results from the operation of a Sequencing Batch Reactor with chlorine disinfection and dechlorination. This permit action consists of updating boilerplate, moving downstream the proposed Outfall 001, adding bacteria monitoring, and adding a 0.0399 MGD flow tier. (SIC Code: 4952)

- 1. Facility Name and Address:**

**Franklin County Commerce Center WWTP**  
**Franklin County**  
**40 East Court Street**  
**Rocky Mount, VA 24151**

Location: Commerce Drive (west side of Rt. 220, 2 miles south of Rocky Mount)

2. **Permit No:** VA0091103      **Expiration Date:** August 18, 2012

3. **Owner Contact:** Name: Mr. Richard Huff  
Title: County Administrator, Franklin County  
Telephone No: (540) 483-3030

4. **Application Complete Date:** March 22, 2012

Permit Drafted By: Kevin A. Harlow Date: August 9, 2012 Regional Office: BRRO-R  
Reviewed By: KEVIN CRIDER Date: 9/14/12  
Public Comment Period Dates: 8/15/12 → 9/17/12

- #### **5. Receiving Waters Classification:**

Receiving Stream Name: North Fork, Little Chestnut Creek River Mile: 3.85  
 Basin: Roanoke River Subbasin: Roanoke River  
 Section: 6a Class: III Special Standards: None  
 1-Day, 10-Year Low Flow: 0.18 MGD 1-Day, 10-Year High Flow: 0.81 MGD  
 7-Day, 10-Year High Flow: 0.21 MGD 7-Day, 10-Year High Flow: 0.91 MGD  
 30-Day, 5-Year Low Flow: 0.46 MGD Harmonic Mean Flow: 1.71 MGD  
 30-Day, 10-Year Low Flow: 0.33 MGD Annual Average Flow: 3.97 MGD  
 1-Day, 30-Year Low Flow: 0.09 MGD 30-Day, 10-Year High Flow: 1.29 MGD  
 Tidal: No 303(d) Listed: No

**Attachment A** contains a copy of the flow frequency determination memorandum.

6. **Operator License Requirements:** IV

7. **Reliability Class:** II

8. **Permit Characterization:**

( ) Private ( ) Federal ( ) State (X) POTW ( ) PVOTW  
( ) Possible Interstate Effect ( ) Interim Limits in Other Document

9. **Wastewater Treatment System:** A description of the wastewater treatment system is provided below. See **Attachment B** for wastewater treatment schematics and **Attachment C** for a copy of the site visit report. **Table I** below lists proposed treatment units associated with the discharge.

The wastewater treatment works is designed to serve a projected population of 400 from businesses in the industrial park. The treatment system consists of a 0.02 MGD sequencing batch reactor (SBR) treatment system. Sanitary wastewater from the industrial park is treated in the SBR. The SBR discharges to a flow equalization basin from which there is a continuous flow to disinfection. Following chlorine disinfection and dechlorination, the effluent will be discharged to the North Fork of Little Chestnut Creek. Sludge is contained in the sludge holding tank/digester until it is pumped and hauled to Ferrum Sewage Treatment Plant. The facility has not begun discharging to Outfall 001 but instead has been disposing of its treated wastewater through an onsite subsurface disposal system.

Outfall Number	Discharge Source <b>Table I: DISCHARGE DESCRIPTION</b>	Treatment (Unit by Unit)	Flow (Design) (MGD)
001	Franklin County Commerce Center WWTP	Sequencing Batch Reactor Flow Equalization Chlorine Disinfection Dechlorination	0.02 MGD (0.0399 MGD future flow tier)

10. **Sewage Sludge Use or Disposal:** A VPDES Sewage Sludge Permit Application Form was submitted for this facility to address disposal of sewage sludge from the wastewater treatment facility. Sludge will be periodically transported to the Ferrum Sewage Treatment Plant.

11. **Discharge Location Description:** A USGS topographic map which indicates the proposed discharge location, any significant dischargers, any water intakes, and other items of interest is included in **Attachment D**. The latitude and longitude of the proposed discharge is 36.93024, -79.8728. This discharge location is 320 feet downstream of the previously proposed outfall location.

Name of Topo: Gladehill Number: 049A

12. **Material Storage:** The permittee has proposed chlorination as the disinfection method. Chlorine and a dechlorination material will be stored on site.
13. **Ambient Water Quality Information:** Memoranda or other information which helped to develop permit conditions (special water quality studies, STORET data, and any other biological and/or chemical data, etc.) are listed below.

Several flow measurements were made on Little Chestnut Creek from 1981 to 1984 at the Route 724 bridge near Sydnorsville, VA. Also, flow records are available from a continuous record gauge on the Pigg River near Sandy Level, Virginia. The flow frequencies from the reference gauge were plotted on a regression line and the associated flow frequencies at the measurement site were determined from the graph. The flow frequencies for the discharge point were determined using proportional drainage areas. See **Attachment A** for a summary of the flow frequencies.

No chemical monitoring data have been collected on the North Fork of Little Chestnut Creek. Background temperature, pH, and hardness data were available from STORET Station 4ACNT001.32. This station is located on the main stem of Little Chestnut Creek at the Route 715 bridge. The 90<sup>th</sup> percentile pH and temperature values were derived from data collected from 1996 through 2005. **Attachment E** contains these STORET data.

The permittee proposes a discharge into the Big Chestnut Creek/Little Chestnut Creek Watershed (VAW-L15R). Big Chestnut Creek is a 2010 bacteria 303(d) listed segment extending from the confluence with Little Chestnut Creek downstream to its confluence with the Pigg River. The discharge enters upstream from the impairment into the North Fork of Little Chestnut Creek. The North Fork of Little Chestnut Creek is not on the 303(d) list, however, the Bacteria Total Maximum Daily Load Development for Pigg River, Snow Creek, Story Creek, and Old Womans Creek, approved by EPA in 2006, assigns a Wasteload Allocation for this facility.

14. **Antidegradation Review and Comments:** Tier I \_\_\_\_\_ Tier II X Tier III \_\_\_\_\_

The State Water Control Board's Water Quality Standards includes an antidegradation

policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier I or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier II water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier II waters is not allowed without an evaluation of the economic and social impacts. Tier III water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with Tier determination. The North Fork of Little Chestnut Creek in this segment (VAW-L15R) is not listed on Part I of the 303(d) list for exceedance of water quality criteria. The North Fork of Little Chestnut Creek is determined to be a Tier II water, and no significant degradation of existing quality is allowed. This determination is based on the fact that there are no data to indicate that this water is not better than the standards for all parameters that the Board has adopted criteria.

For purposes of aquatic life protection in Tier II waters, "significant degradation" means that no more than 25 percent of the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10 percent of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The antidegradation baseline for aquatic life and human health are calculated for each pollutant as follows:

$$\text{Antidegradation baseline (aquatic life)} = 0.25 (\text{WQS} - \text{existing quality}) + \text{existing quality}$$

$$\text{Antidegradation baseline (human health)} = 0.10 (\text{WQS} - \text{existing quality}) + \text{existing quality}$$

Where:

"WQS" = Numeric criterion listed in 9 VAC 25-260-5 et seq. for the parameter analyzed

"Existing quality" = Concentration of the parameter being analyzed in the receiving stream

These "antidegradation baselines" become the new water quality criteria in Tier II waters and effluent limits for future expansions or new facilities must be written to maintain the antidegradation baselines for each pollutants. Antidegradation baselines have been calculated as described above and included in Attachment F. Antidegradation guidelines are applicable and have been applied to this permit issuance because it is a new discharge.

Water quality based effluent limits for pH, total residual chlorine (TRC), ammonia, E. coli, and dissolved oxygen have been established in compliance with antidegradation requirements set forth in 9 VAC 25-260-30 of the water quality standards regulations. In accordance with antidegradation policy, pH will be maintained within the range of 6.0 S.U.

and 9.0 S.U. The TRC, ammonia, and dissolved oxygen limitations for the discharge have been established to prevent any significant lowering of water quality and identify the quality that must be maintained by the current proposal as well as future proposals. The E. coli limitations are established to maintain compliance with the TMDL WLA for the facility.

15. **Site Inspection:** Date: 06/19/02 Performed by: Kevin Harlow; Jason Winningham  
**Attachment C** contains a copy of the site visit memorandum.
16. **Effluent Screening and Limitation Development:** DEQ Guidance Memorandum 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq). **Attachment E** contains data from STORET Station 4ACNT001.32 used to calculate the 90<sup>th</sup> percentile values for pH and temperature. Refer to **Attachment F and Table II** for the effluent limitation document for the 0.02 MGD facility and **Attachment G and Table III** for the 0.0399 MGD facility. Monitoring frequencies are not reduced since the facility has not begun discharging through Outfall 001.

A. **Mixing Zone**

The MIXER program was run to determine the percentage of the receiving stream flow that could be used in the wasteload allocation calculations. The program output indicated that 100 percent of the 7Q10 and 100 percent of 1Q10 may be used for calculating acute and chronic wasteload allocations (WLAs). A copy of the printout from the MIXER run is enclosed in **Attachment F and G**.

B. **Effluent Limitations for Conventional Pollutants**

**Flow** -- The permittee submitted a VPDES Permit Application for a design flow of 0.02 MGD. In accordance with the current VPDES Permit Manual, flow is to be estimated and recorded per day of discharge. A design flow of 0.0399 MGD is proposed as an upgrade.

**pH** -- The pH limits of 6.0 S.U. minimum and 9.0 S.U. maximum are required. These limits are based upon the water quality criteria in 9 VAC 25-260-50 for Class III receiving waters and are in accordance with federal technology-based guidelines, 40 CFR Part 133, for secondary treatment. Grab samples shall be collected once per day of discharge.

**Biochemical Oxygen Demand (BOD<sub>5</sub>) and Total Suspended Solids (TSS)** -- The Regional Water Quality Model for Free Flowing Streams, Version 4.11 was used to evaluate the effects of the discharge on the dissolved oxygen levels in the receiving stream.

A 1625 foot stream segment following the discharge was evaluated to determine if  $BOD_5$ , total kjeldahl nitrogen (TKN), or dissolved oxygen (DO) limits were needed to comply with water quality standards and prevent antidegradation to this Tier II water. To comply with antidegradation criteria for DO, TKN, and  $BOD_5$ , no significant lowering of DO is allowed. Significant lowering is defined as more than 0.2 mg/l from the existing level (90 percent DO saturation value).

The 90<sup>th</sup> percentile temperature and pH values for the model were derived from STORET monitoring station, 4ACNT001.32, located on the main stem Little Chestnut Creek downstream from the confluence with the North Fork of Little Chestnut Creek. Estimated effluent maximum daily and average daily temperature values were not submitted on Form 2A of the VPDES permit application since this is a proposed facility. STORET data representative of the receiving stream was used for the effluent parameters.

For the 0.02 MGD design flow, an initial DO concentration of 5.3 mg/l, a TKN value of 9.0 mg/l, and a secondary treatment limit of 30 mg/l for  $BOD_5$  were used in the model input. The background DO level of the receiving stream is 7.575 mg/l. The model predicted an initial DO concentration of 7.375 after initial mixing, corresponding to the maximum DO drop of 0.2 mg/l allowed by antidegradation policy. Following initial mixing the DO increases to the background level. Thus, a DO limit of 5.3 mg/l is needed to prevent degradation of the receiving stream. Updated receiving stream data, in particular a lower 7Q10 flow, resulted in the limit changing from 5.0 mg/l to 5.3 mg/l of DO.

For the 0.0399 MGD design flow, an initial DO concentration of 6.4 mg/l, a TKN value of 9.0 mg/l, and a secondary treatment limit of 30 mg/l for  $BOD_5$  were used in the model input. The background DO level of the receiving stream is 7.575 mg/l. The model predicted an initial DO concentration of 7.384 after initial mixing with a sag of 7.383 prior to increasing towards the background level. The DO drop in this model does not exceed 0.2 mg/L drop in DO allowed by the antidegradation policy. Thus, a DO limit of 6.4 mg/l is needed to prevent degradation of the receiving stream.

Secondary treatment standards as mandated by the federal technology-based guidelines (40 CR Part 133.102) can be applied to the  $BOD_5$  and TSS limits. Effluent limits of 30 mg/l as a monthly average and 45 mg/l as a maximum weekly average have been required for TSS and  $BOD_5$  with monitoring at once per month of discharge by grab sample. See **Attachment G** for the water quality model output and supporting data. For the

*E. coli* -- A new *E. coli* monthly average limit, calculated as a geometric mean, of 126 N/100 ml and a maximum of 126 N/100 mL has been added to the permit. Monitoring will be performed once per year. The monitoring will consist of once per week grab samples during the month bacteria monitoring occurs in order to calculate the geometric mean. Previously DEQ has allowed the use chlorine disinfection monitoring requirements as a surrogate for *E. coli*. However, the EPA has questioned the adequacy of the use of surrogate parameters for demonstrating compliance with TMDL wasteload allocations. Consequently, VPDES Permit Manual (Rev. 1/27/2010) Section MN-3 B.2 requires *E. coli* limits in permits with TMDL *E. coli* allocations. The new *E. coli* limit is required to demonstrate compliance with the bacteria wasteload allocation that is assigned to the facility in the Bacteria TMDL for Pigg River, Snow River, Story Creek, and Old Womans Creek (excerpted in Appendix E). Compliance with the new *E. coli* limit of 126 cfu/100mL and Part I.C.2 – 95% Capacity Reopener ensures compliance with the bacteria TMDL wasteload allocation of 3.48E+10 cfu/year. The TMDL allocation is based on 4 weekly samples collected during a calendar month. If four or more weekly samples cannot be collected, each sample must comply with a maximum limit of 126 cfu/100mL.

### C. Effluent Limitations for Toxic Pollutants

**Ammonia as Nitrogen** -- Since the application is for a proposed domestic wastewater treatment plant, an average ammonia concentration of 9.0 mg/l is assumed for the effluent. The 90th percentile temperature and pH data from STORET monitoring station 4ACNT001.32 on Little Chestnut Creek were used to determine the antidegradation wasteload allocations (AWLAs). The AWLAs for the receiving stream were used in the STATS 2.0.4 program to determine the reasonable potential to exceed the water quality standards. For the Tier II receiving stream, antidegradation baselines were established to allocate no more than 25 percent of the unused assimilative capacity for the protection of aquatic life. Since no data exists for the stream, the existing background concentrations of pollutants are assumed to be zero. Thus, baselines are equal to 25 percent of the criteria as listed in Virginia's Water Quality Standards (9 VAC 25-260-00 et seq).

The acute and chronic AWLAs for ammonia were input into the agency STATS program together with one datum value of 9 mg/l. The STATS program determined that a chronic-based limit of 9.7 mg/l is needed for ammonia as nitrogen. Attachment F contains the spreadsheet used to calculate the stream standards and antidegradation

wasteload allocations and the results of the reasonable potential determination for ammonia (STATS program). This new limit is a relaxation of the previous limit of 3.13 mg/l of ammonia and resulted from updated receiving stream pH and temperature and a revised water quality standard for ammonia. Given the status of the facility as a proposed treatment works, the previous limit was to become effective with the commencement of discharge. Since the limit never became effective, the relaxation of the limit does not violate antibacksliding regulations contained in Section 402(o) of the Clean Water Act and the Virginia VPDES permit regulation at 9 VAC-25-31-220.L.

**Total Residual Chlorine (TRC)** -- The facility has proposed to use chlorination as the disinfection method. In the absence of TRC data, one data value, equal to the QL, was assumed to exist. This methodology is similar to that discussed in Guidance Memorandum 00-2011 for ammonia. Antidegradation WLAs (AWLAs) have been established for TRC to protect the receiving stream from degradation. Since no data exist for the Tier II receiving stream, the baseline is equal to 25 percent of the criterion.

The acute and chronic AWLAs for TRC were input into the STATS program to calculate appropriate limits. Based on the Agency's STATS program, permit limits of 0.023 mg/l monthly average and 0.028 mg/l maximum weekly average have been included in the permit. Grab samples are required once per day of discharge. See **Attachment F** for the AWLA spreadsheet and STATS program output. These limits are more stringent than those in the previous permit due to a decrease in the critical flows in the receiving stream.

17. **Basis for Sludge Use and Disposal Requirements:** Since the facility will transport sludge to the Ferrum Sewage Treatment Plant, there are no limits or monitoring requirements associated with sludge use or disposal beyond compliance with the Sludge Management Plan approved with the issuance of the permit.
18. **Antibacksliding Statement:** No limits have been made less stringent.
19. **Compliance Schedules:** For this reissuance, there are no compliance schedules.
20. **Special Conditions:** A brief rationale for each special condition contained in the permit is given below.
  - A. **Total Residual Chlorine (TRC) Limitations and Monitoring Requirements (Part I.B)**  
**Rationale:** Required by Sewage Collection and Treatment Regulations, 9VAC25-790. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit.

This ensures proper operation of chlorination equipment to maintain adequate disinfection.

**B. Compliance Reporting under Part I.A (Part I.C.1)**

Rationale: Authorized by VPDES Permit Regulation, 9VAC25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

**C. 95% Capacity Reopener (Part I.C.2)**

Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 B 4 for all POTW and PVOTW permits.

**D. CTC, CTO Requirement (Part I.C.3)**

Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

**E. Licensed Operator Requirement (Part I.C.4)**

Rationale: The VPDES Permit Regulation, 9VAC25-31-200 C and the Code of Virginia § 54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.), require licensure of operators.

**F. Reliability Class (Part I.C.5)**

Rationale: Required by Sewage Collection and Treatment Regulations, 9VAC25-790 for all municipal facilities.

**G. Sludge Reopener (Part I.C.6)**

Rationale: Required by VPDES Permit Regulation, 9VAC25-31-220 C for all permits issued to treatment works treating domestic sewage.

**H. Sludge Use and Disposal (Part I.C.7)**

Rationale: VPDES Permit Regulation, 9VAC25-31-100 P; 220 B 2; and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.

**I. Indirect Dischargers (Part I.C.8)**

Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 B 1 and B 2 for POTWs and PVOTWs that receive waste from someone other than the owner of the

treatment works.

J. **O&M Manual Requirement (Part I.C.9)**

Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9VAC25-31-190 E.

K. **Total Maximum Daily Load (TMDL) Reopener (Part I.C.10)**

Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

L. **Permit Application Requirement (Part I.C.11)**

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-100 D. and 40 CFR 122.21 (d)(1) require a new application at least 180 days prior to expiration of the existing permit. In addition, the VPDES Permit Regulation, 9 VAC 25-31-100 E.1. and 40 CFR 122.21 (e)(1) note that a permit shall not be issued before receiving a complete application.

M. **Materials Handling/Storage (Part I.C.12)**

Rationale: 9VAC25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste

N. **Conditions Applicable to All VPDES Permits (Part II)**

Rationale: VPDES Permit Regulation, 9VAC25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. **Changes to the Permit:** Any changes in a permit that differ from a previously issued permit are listed here.

- A. Monthly average and maximum daily limitations for E. coli of 126 N/100 mL have been added in order to demonstrate compliance with the TMDL wasteload allocation.
- B. The location of Outfall 001 is moved 320' downstream.
- C. Special conditions have been updated to the current boilerplate language in the 2010 VPDES Permit Manual.

- D. Effluent limitations have been added for a proposed future treatment works design of 0.0399 MGD. The limitations are discussed in Fact Sheet section 16 and Table II.
  - E. Added a Materials Handling/Storage special condition.
22. **Variances/Alternate Limits or Conditions:** No variances or alternate limits or conditions are included in this permit.
23. **Regulation of Treatment Works Users:** VPDES Permit Regulation 9 VAC 25-31-280 B9 requires that every permit issued to a treatment works owned by a person other than a state or municipality provide an explanation of the Board's decision on the regulation of users. The treatment works at Franklin County Commerce Center is municipally owned. Therefore, this regulation does not apply.
24. **Public Notice Information required by 9 VAC 25-31-290 B:**

All pertinent information is on file and may be inspected, and copied by contacting Kevin A. Harlow at:

Virginia DEQ  
Blue Ridge Regional Office  
3019 Peters Creek Road  
Roanoke, VA 24019  
540-562-6700  
[Kevin.Harlow@deq.virginia.gov](mailto:Kevin.Harlow@deq.virginia.gov)

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the DEQ Blue Ridge Regional Office by appointment.

25. **Additional Comments:**

- A. **Previous Board Action:** None
- B. **Staff Comments:** None.
- C. **Public Comments:** None.
- D. **Other Agency Comments:** None

26. **303(d) Listed Segments (TMDL):** The permittee proposes to discharge into the North Fork of Little Chestnut Creek in the Big Chestnut Creek/Little Chestnut Creek Watershed (VAW-L15R). The North Fork of Little Chestnut Creek is not on the 303(d) list, however, the Pigg River Bacteria TMDL, approved by EPA on 9/11/2006, includes the Big Chestnut Creek/Little Chestnut Creek Watershed. The TMDL assigns a Wasteload Allocation for the 0.02 MGD facility of  $3.48E+10$  cfu/year. The original TMDL was designed to accommodate increases in permit capacity such as the revised flow discharge rate of 39,000 gallons per day for the previously permitted facility. Updating the allocations in the Bacteria TMDL Development for Pigg River will be protective of the 126 E. coli cfu/100 mL water quality standard for bacteria and reflect the proposed permit and will not cause or contribute to additional violations of the bacteria water quality standard.

Table II  
BASIS FOR LIMITATIONS

( ) Interim Limitations  
(x) Final Limitations

OUTFALL: 001  
DESIGN FLOW: 0.02 MGD

Effective Dates - From: Commencement of Discharge  
To: Expiration Date or CTO of  
0.0399 MGD Facility

<u>PARAMETER</u>	<u>BASIS FOR LIMITS</u>	<u>DISCHARGE LIMITS</u>				<u>MONITORING REQUIREMENTS</u>	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/Day	Estimate
pH (Standard Units)	1, 3	NA	6.0	NA	9.0	1/Day	Grab
BOD <sub>5</sub>	1	30 mg/l 2.27 kg/d	45 mg/l 3.41 kg/d	NA	NA	1/Month	Grab
Dissolved Oxygen	3	NA	NA	5.3 mg/l	NA	1/Day	Grab
Total Suspended Solids	1	30 mg/l 2.27 kg/d	45 mg/l 3.41 kg/d	NA	NA	1/Month	Grab
Ammonia as Nitrogen (NH <sub>3</sub> -N)	3	9.7 mg/l	9.7 mg/l	NA	NA	1/Month	Grab
Total Residual Chlorine	3	0.023 mg/l	0.028 mg/l	NA	NA	1/Day	Grab
E.Coli (n/100mL)	3,4	126 n/100mL (geometric mean)	NA	NA	126 n/100mL	1/Yr	Grab

1/D-Month = 1/ Month

NA = Not Applicable

1/D-Week = 1/Week

NL = No Limitations, monitoring only

1/D-Day = 1/Day

The basis for the limitations codes are:

1. Federal Effluent Guidelines: (Secondary Treatment Requirement)
2. Best Professional Judgement
3. Water Quality Standards
4. Other (TMDL)

**Table III**  
**BASIS FOR LIMITATIONS**

( ) Interim Limitations  
(x) Final Limitations

OUTFALL: 001  
DESIGN FLOW: 0.0399 MGD

Effective Dates - From: CTO of 0.0399 MGD  
To: Expiration Date

<u>PARAMETER</u>	BASIS FOR LIMITS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/Day	Estimate
pH (Standard Units)	1, 3	NA	6.0	NA	9.0	1/Day	Grab
BOD <sub>5</sub>	1	30 mg/l 2.27 kg/d	45 mg/l 3.41 kg/d	NA	NA	1/Month	Grab
Dissolved Oxygen	3	NA	NA	6.4 mg/l	NA	1/Day	Grab
Total Suspended Solids	1	30 mg/l 2.27 kg/d	45 mg/l 3.41 kg/d	NA	NA	1/Month	Grab
Ammonia as Nitrogen (NH <sub>3</sub> -N)	3	5.6 mg/l	5.6 mg/l	NA	NA	1/Month	Grab
Total Residual Chlorine	3	0.012 mg/l	0.015 mg/l	NA	NA	1/Day	Grab
E.Coli (n/100mL)	3,4	126 n/100mL (geometric mean)	NA	NA	126 n/100mL	1/Yr	Grab

1/D-Month = 1/ Month

NA = Not Applicable

1/D-Week = 1/Week

NL = No Limitations, monitoring only

1/D-Day = 1/Day

The basis for the limitations codes are:

1. Federal Effluent Guidelines: (Secondary Treatment Requirement)
2. Best Professional Judgement
3. Water Quality Standards
4. Other (TMDL)

## **Attachments**

- A. Flow Frequency Memorandum**
- B. Wastewater Treatment Diagrams**
- C. Site Visit Report**
- D. USGS Topographic Map**
- E. Ambient Water Quality Information**
  - STORET Data (Station 4ACNT001.32)
  - 2000 305b Watershed Summary Report (Excerpt)
- F. Wasteload and Limit Calculations – 0.02 MGD**
  - Mixing Zone Calculations (MIXER)
  - Wasteload Allocation Spreadsheet
  - STATS Program Results
  - Regional Water Quality Model (Version 4.11)
- G. Wasteload and Limit Calculations – 0.0399 MGD**
  - Mixing Zone Calculations (MIXER)
  - Wasteload Allocation Spreadsheet
  - STATS Program Results
  - Regional Water Quality Model (Version 4.11)

**Attachment A**

**Flow Frequency Memorandum**

## MEMORANDUM

### DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION West Central Regional Office 3019 Peters Creek Road Roanoke, Virginia 24019

**SUBJECT:** Flow Frequency Determination  
Franklin County Commerce Center

**TO:** Permit Development File

**FROM:** Kevin Harlow, Water Permit Writer, WCRO

**DATE:** August 8, 2007

The Franklin County Commerce Center WWTP discharges to the North Fork Little Chestnut Creek near Rocky Mount, VA. Stream flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

The USGS conducted several flow measurements on the Little Chestnut Creek from 1981 to 1984. The measurements were made at the Route 724 bridge, near Sydnorsville, VA. The measurements were correlated with the same day daily mean values from the continuous record gage on the Pigg River near Sandy Level, VA #02058400. The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gage were plugged into the equation for the regression line and the associated flow frequencies at the measurement site were calculated. The values for the measurement site were projected to the discharge point using proportional drainage areas. The values for the reference gage, measurement site, and the discharge point are presented below:

#### Pigg River near Sandy Level, VA (#02058400) Drainage Area = 350 mi<sup>2</sup>

1Q10	=	42 cfs	High Flow 1Q10	=	123 cfs
7Q10	=	47 cfs	High Flow 7Q10	=	134 cfs
30Q10	=	65 cfs	High Flow 30Q10	=	171 cfs
30Q5	=	83 cfs	Harmonic Mean	=	209 cfs
1Q30	=	27 cfs	Annual Average	=	379 cfs

#### Little Chestnut Creek near Sydnorsville, VA (#02057750) Drainage Area = 15.49 mi<sup>2</sup>

1Q10	=	0.88 cfs	High Flow 1Q10	=	4.03 cfs
7Q10	=	1.03 cfs	High Flow 7Q10	=	4.55 cfs
30Q10	=	1.64 cfs	High Flow 30Q10	=	6.42 cfs
30Q5	=	2.31 cfs	Harmonic Mean	=	19.8 cfs
1Q30	=	0.47 cfs			

**North Fork Little Chestnut Creek at discharge point**  
**Drainage Area = 4.81 mi<sup>2</sup>**

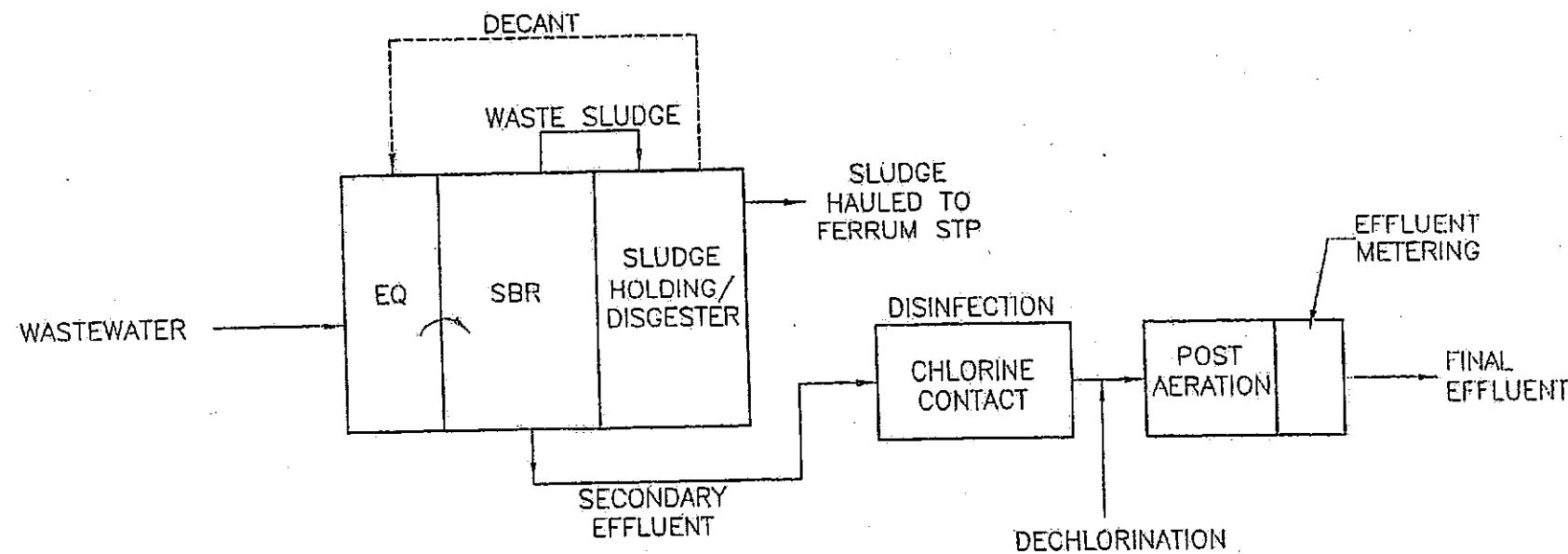
1Q10 = 0.27 cfs (0.18 MGD)  
7Q10 = 0.32 cfs (0.21 MGD)  
30Q10 = 0.51 cfs (0.33 MGD)  
30Q5 = 0.72 cfs (0.46 MGD)  
1Q30 = 0.15 cfs (0.09 MGD)

High Flow 1Q10 = 1.25 cfs (0.81 MGD)  
High Flow 7Q10 = 1.41 cfs (0.91 MGD)  
High Flow 30Q10 = 1.99 cfs (1.29 MGD)  
Harmonic Mean = 2.65 cfs (1.71 MGD)  
Annual Average = 6.14 cfs (3.97 MGD)

The high flow months are January through May. This analysis does not address withdrawals or discharges upstream of the discharge point.

**Attachment B**

**Wastewater Treatment Diagrams**



#### Process Description

Wastewater is equalized prior to the Sequencing Batch Reactor (SBR) where biological treatment is accomplished. The treated wastewater is then disinfected by chlorination and dechlorinated prior to the post aeration and metering chamber. The final effluent is discharged into the North Fork of Little Chestnut Creek.

Waste sludge is pumped from the SBR to the Sludge Holding/Digester. The sludge is then hauled as needed to the Ferrum Sewage Treatment Facility for dewatering and disposal. The decant from the digester is returned to the EQ Basin for further processing.

## FRANKLIN COUNTY COMMERCE CENTER WWTP PROCESS SCHEMATIC



ANDERSON  
AND  
ASSOCIATES, Inc.

Engineers  
Surveyors  
Planners

Blacksburg, VA  
Greensboro, NC  
Richmond, VA  
Tri-Cities, TN

DRAWN CMP	SCALE NTS*	DATE 15 MAR 02	DOCUMENT NO. 20452-002
--------------	---------------	-------------------	---------------------------

**Attachment C**

**Site Visit Report**

M E M O R A N D U M

DEPARTMENT OF ENVIRONMENTAL QUALITY  
*West Central Regional Office*

3019 Peters Creek Road

Roanoke, VA 24019

SUBJECT: Site Visit Report for Franklin County Commerce Center WWTP (Proposed)  
Issuance of VPDES Permit

TO: Permit File

FROM: Kevin A. Harlow, Environmental Engineer Senior

DATE: July 2, 2002

On June 16, 2002, Jason Winingham and I inspected the site for the proposed Franklin County Commerce Center. The industrial park will be located on Commerce Drive on the west side of Rt. 220, approximately 2 miles south of Rocky Mount. Due to the potential for a new industry in the park that could have 400 employees, the County of Franklin is planning a 0.02 MGD wastewater treatment facility to treat the domestic sewage from this industry. The effluent will be discharged into the North Fork of Little Chestnut Creek.

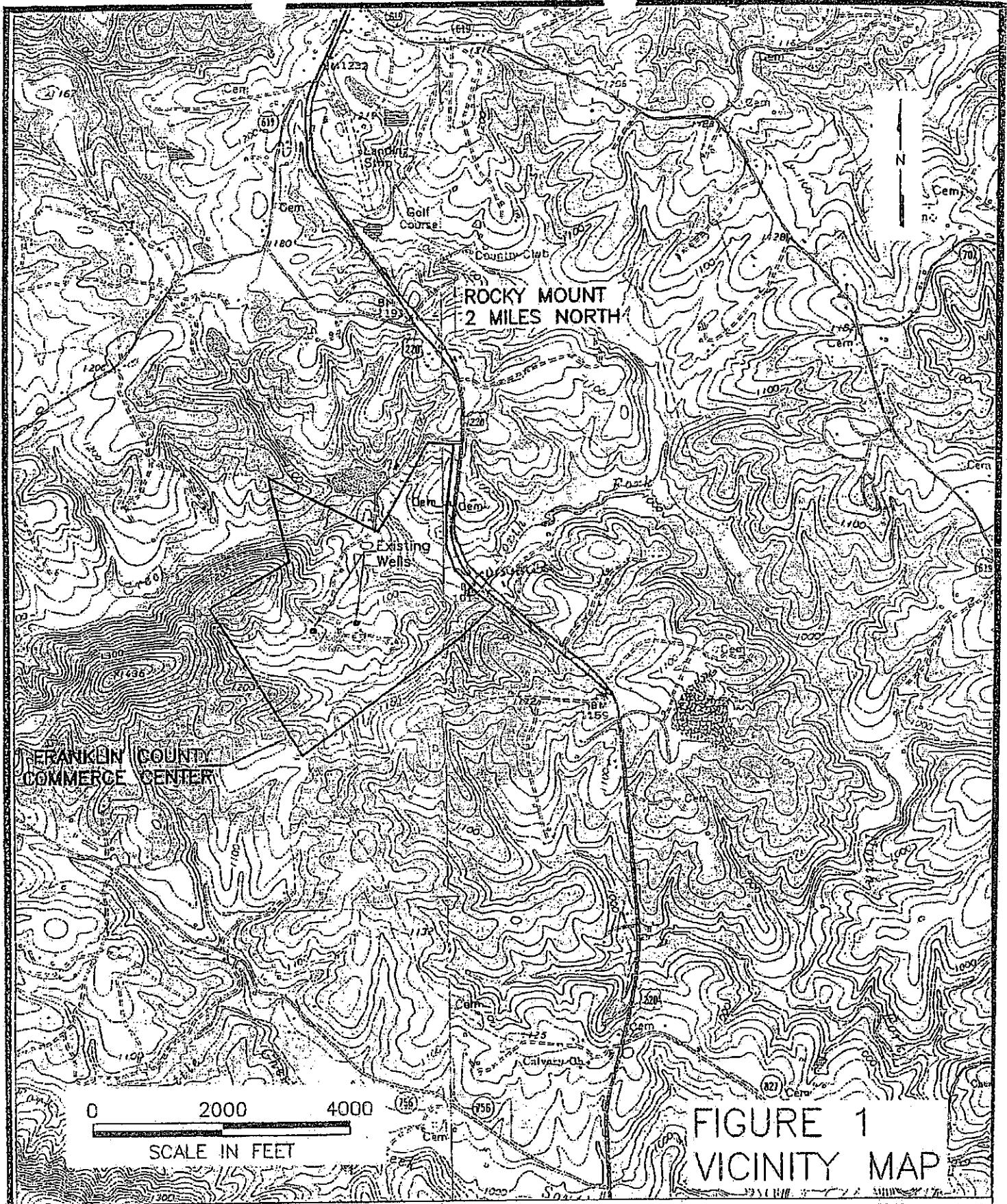
At the proposed discharge location, the stream was approximately 8 feet wide and approximately 6 inches deep. The creek bed was rectangular and characterized by small to medium rock and silt. The stream bank was relatively shallow. The water appeared fairly clear, and there was no evidence of algal or plant growth in the water. The stream moderately meandered.

The nearest downstream house is located several hundred feet downstream from the proposed outfall. The stream runs in an eastern direction away from Rt. 220. The land adjacent to the creek over the half mile downstream from the discharge point is farmland. The stream had approximately equal length sections of pools and riffles.

The creek bank was relatively shallow and there was grass along the sides of the stream. There were many cows within 50 feet of the creek on the adjacent farmland downstream from the discharge. Several cows were observed to be cooling themselves in the stream at the time of the visit.

**Attachment D**

**USGS Topographic Map**



**FIGURE 1**  
**VICINITY MAP**



**ANDERSON & ASSOCIATES, INC.**  
Professional Design Services  
www.andassoc.com  
Virginia - North Carolina - Tennessee

100 Argonne St.  
Blacksburg, Va. 24060  
540-552-5592

DRAWN CMP	SCALE 1"=2000'	DATE 15 MAR 02	DOCUMENT NO. 20452-002
--------------	-------------------	-------------------	---------------------------

## **Attachment E**

### **Ambient Water Quality Information**

- STORET Data (Station 4ACNT001.32)
- Bacteria TMDL for Pigg River, Snow River, Story Creek, and Old Womans Creek  
(excerpt)

**Station ID:** 4ACNT001.32  
**Location:** Chestnut Creek  
 at Rt. 715 Bridge

Collection Date Time	Temp	Do Probe	Field Ph	Hardness
10/15/1996 11:30	14.1	7.8	7.9	20.0
01/13/1997 12:00	1.4	13.5	8.1	18.0
04/07/1997 12:00	16.2	9.4	8.1	18.5
07/31/1997 12:00	19.7	8.0	8.0	18.1
10/15/1997 11:30	15.8	8.0	7.9	18.6
01/27/1998 12:00	3.2	13.0	7.5	17.7
03/30/1998 11:30	17.8	9.0	8.0	29.2
07/13/1998 13:00	23.6	7.9	8.4	50.7
10/22/1998 13:00	11.8	9.5	8.7	18.0
01/25/1999 12:00	8.0	10.0	7.6	30.0
04/12/1999 12:30	14.6	8.4	7.7	20.0
08/10/1999 12:30	23.0	7.7	7.9	20.9
10/07/1999 11:30	13.6	8.9	8.0	40.0
12/20/1999 12:00	7.0	9.6	7.5	21.2
02/10/2000 11:00	3.0	10.6	7.1	22.5
04/06/2000 12:00	13.4	9.9	7.0	18.0
06/20/2000 11:30	23.1	7.6	7.8	29.0
07/19/2000 10:05	23.2	8.0	7.4	20.0
09/14/2000 11:45	20.8	7.4	7.4	13.9
11/20/2000 12:30	5.0	12.3		20.1
01/22/2001 12:30	3.0	12.7	8.5	24.0
05/07/2001 12:20	17.4	8.9	8.9	13.3
08/11/2003 10:25	20.4	8.6	7.2	
10/30/2003 11:20	10.7	9.9	7.1	
12/16/2003 10:30	7.5	12.3	7.6	
02/04/2004 14:45	4.8	11.4	6.5	
04/20/2004 10:00	17.5	9.3	6.8	
06/16/2004 10:45	21.5	9.0	6.9	
08/31/2004 10:15	21.3		7.0	
10/19/2004 13:00	12.6	9.6	6.6	
10/19/2004 13:05	12.6	9.6	6.6	
10/25/2004 10:45	13.7	10.2	6.5	
12/27/2004 11:45	1.5	12.4	7.2	
02/16/2005 11:00	8.7	11.1	6.8	
04/27/2005 11:45	13.8	10.0	7.7	
06/28/2005 11:10	21.2	7.8	7.4	
02/17/2011 11:30	6.8		7.6	
04/07/2011 11:00	13.0		8.3	
06/23/2011 11:30	22.9		8.2	
08/23/2011 11:30	20.8		8.2	
10/11/2011 10:30	15.1		8.3	
12/08/2011 10:30	8.8		8.1	
02/15/2012 11:00	6.3		7.6	
03/08/2012 12:00	11.0		7.6	
05/08/2012 11:00	19.1		8.0	
10th Percentile	3.8	7.8	6.8	17.7
90th Percentile	22.3	12.3	8.3	29.9
Average	13.6	9.7	7.6	22.8

# **Bacteria Total Maximum Daily Load Development for Pigg River, Snow Creek, Story Creek, and Old Womans Creek**

**Submitted by:**

Virginia Department of Environmental Quality  
Virginia Department of Conservation and Recreation

**Prepared by:**

Department of Biological Systems Engineering, Virginia Tech



April 2006

VT-BSE Document No. 2006-0002

**Table 4.1. Potential fecal coliform sources and daily fecal coliform production by source for existing conditions in the Pigg River and Old Womans Creek watersheds.**

Potential Source	Population in Pigg River	Population in Old Womans Creek	Fecal coliform produced ( $\times 10^6$ cfu/head/day)
Humans	22,129	487	2,000 <sup>a</sup>
Dairy Cattle			
Milk and dry cows	4,831	0	18,950 <sup>b</sup>
Heifers <sup>c</sup>	2,497	0	8,663 <sup>d</sup>
Beef Cattle	5,970	248	9,600 <sup>b</sup>
Pets	9,094	194	450 <sup>e</sup>
Poultry - Pullets	17,000	0	28 <sup>f</sup>
Llamas	50	0	28,000 <sup>g</sup>
Horses	292	19	420 <sup>h</sup>
Deer	11,793	390	350
Raccoons	8,665	272	50
Muskrats	1,262	28	25 <sup>i</sup>
Beavers	1,378	20	0.2
Wild Turkeys	3,095	75	93
Ducks <sup>j</sup>	4,392; 2,927	115; 78	2,400
Geese <sup>j</sup>	5,123; 3,658	136; 97	800

<sup>a</sup> Source: Geldreich (1978)

<sup>b</sup> Based on data presented by Metcalf and Eddy (1979) and ASAE (1998)

<sup>c</sup> Includes calves

<sup>d</sup> Based on weight ratio of heifer to milk cow weights and fecal coliform produced by milk cow

<sup>e</sup> Source: Weiskel *et al.* (1996)

<sup>f</sup> Based on bacteria concentration in chicken manure (ASAE(1998)) and relative manure production by pullets and chickens

<sup>g</sup> Based on bacteria production by sheep (ASAE(1998)) and relative weights of sheep and goats (ASAE(1998)); goats and llamas were assumed to have similar fecal coliform production rates

<sup>h</sup> Source: ASAE(1998)

<sup>i</sup> Source: Yagow (2001)

<sup>j</sup> Population given as winter; summer population

**Table 4.2. Permitted facilities discharging into the streams of the Pigg River watershed.**

Permit Number	Facility Name	Sub-watershed	Design Flow (mgd <sup>k</sup> )	Permitted E. coli Conc. (cfu/100 mL)	E. coli Load (cfu/year)
VA0029254	Ferrum Town – STP	21	0.4	126	$6.99 \times 10^{12}$
VA0091103 <sup>t</sup>	Franklin County Commerce Center WWTP	17	0.02	126	$3.48 \times 10^{10}$
VA0085952	Rocky Mount Town STP	15	2	126	$3.48 \times 10^{12}$

<sup>k</sup> million gallons per day

<sup>t</sup> Not currently online

## **Attachment F**

### **Wasteload and Limit Calculations – 0.02 MGD**

- Mixing Zone Calculations (MIXER)
- Wasteload Allocation Spreadsheet
  - STATS Program Results
- Regional Water Quality Model (v4.11)

## Mixing Zone Predictions for

Franklin County County Commerce Center WWTP

Effluent Flow = 0.02 MGD  
Stream 7Q10 = 0.21 MGD  
Stream 30Q10 = 0.33 MGD  
Stream 1Q10 = 0.18 MGD  
Stream slope = 0.005517 ft/ft  
Stream width = 4 ft  
Bottom scale = 3  
Channel scale = 1

---

### Mixing Zone Predictions @ 7Q10

Depth = .2441 ft  
Length = 45.85 ft  
Velocity = .3642 ft/sec  
Residence Time = .0015 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

---

### Mixing Zone Predictions @ 30Q10

Depth = .3185 ft  
Length = 35.92 ft  
Velocity = .4252 ft/sec  
Residence Time = .001 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

---

### Mixing Zone Predictions @ 1Q10

Depth = .2239 ft  
Length = 49.54 ft  
Velocity = .3456 ft/sec  
Residence Time = .0398 hours

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

---

**FRESHWATER  
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS**

Facility Name: Franklin County Commerce Center WWTP

Permit No.: VA0091103

Receiving Stream: North Fork of Little Chestnut Creek

Version: OWP Guidance Memo 00-2011 (8/24/00)

**Stream Information**

Mean Hardness (as CaCO <sub>3</sub> ) =	80 mg/L
90% Temperature (Annual) =	22.3 deg C
90% Temperature (Wet season) =	22.3 deg C
90% Maximum pH =	8.28 SU
10% Maximum pH =	6.67 SU
Tier Designation (1 or 2) =	2
Public Water Supply (PWS) Y/N? =	n
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

**Stream Flows**

1Q10 (Annual) =	0.18 MGD
7Q10 (Annual) =	0.21 MGD
30Q10 (Annual) =	0.33 MGD
1Q10 (Wet season) =	0.81 MGD
30Q10 (Wet season) =	1.29 MGD
30Q5 =	0.46 MGD
Harmonic Mean =	1.71 MGD

**Mixing Information**

Annual - 1Q10 Mix =	100 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	100 %
- 30Q10 Mix =	100 %

**Effluent Information**

Mean Hardness (as CaCO <sub>3</sub> ) =	80 mg/L
90% Temp (Annual) =	22.3 deg C
90% Temp (Wet season) =	22.3 deg C
90% Maximum pH =	7.6 SU
10% Maximum pH =	6.8 SU
Discharge Flow =	0.02 MGD

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	5	--	--	na	9.9E+02	--	--	na	2.4E+04	--	--	na	1.0E+02	--	--	na	2.4E+03	--	--	na	2.4E+03
Acrolein	0	--	--	na	9.3E+00	--	--	na	2.2E+02	--	--	na	9.3E-01	--	--	na	2.2E+01	--	--	na	2.2E+01
Acrylonitrile <sup>c</sup>	0	--	--	na	2.5E+00	--	--	na	2.2E+02	--	--	na	2.5E-01	--	--	na	2.2E+01	--	--	na	2.2E+01
Aldrin <sup>c</sup>	0	3.0E+00	--	na	5.0E-04	3.0E+01	--	na	4.3E-02	7.5E-01	--	na	5.0E-05	7.5E+00	--	na	4.3E-03	7.5E+00	--	na	4.3E-03
Ammonia-N (mg/l) (Yearly)	0	6.43E+00	1.09E+00	na	--	6.43E+01	1.92E+01	na	--	1.61E+00	2.74E-01	na	--	1.61E+01	4.79E+00	na	--	1.61E+01	4.79E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	5.28E+00	9.93E-01	na	--	2.19E+02	6.50E+01	na	--	1.32E+00	2.48E-01	na	--	5.48E+01	1.63E+01	na	--	5.48E+01	1.63E+01	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	9.6E+05	--	--	na	4.0E+03	--	--	na	9.6E+04	--	--	na	9.6E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	1.5E+04	--	--	na	6.4E+01	--	--	na	1.5E+03	--	--	na	1.5E+03
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+03	1.7E+03	na	--	8.5E+01	3.8E+01	na	--	8.5E+02	4.3E+02	na	--	8.5E+02	4.3E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	na	--	--	--	--	--	--
Benzene <sup>c</sup>	0	--	--	na	5.1E+02	--	--	na	4.4E+04	--	--	na	5.1E+01	--	--	na	4.4E+03	--	--	na	4.4E+03
Benzidine <sup>c</sup>	0	--	--	na	2.0E-03	--	--	na	1.7E-01	--	--	na	2.0E-04	--	--	na	1.7E-02	--	--	na	1.7E-02
Benzo (a) anthracene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.6E+01	--	--	na	1.8E-02	--	--	na	1.6E+00	--	--	na	1.6E+00
Benzo (b) fluoranthene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.6E+01	--	--	na	1.8E-02	--	--	na	1.6E+00	--	--	na	1.6E+00
Benzo (k) fluoranthene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.6E+01	--	--	na	1.8E-02	--	--	na	1.6E+00	--	--	na	1.6E+00
Benzo (a) pyrene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.6E+01	--	--	na	1.8E-02	--	--	na	1.6E+00	--	--	na	1.6E+00
Bis2-Chloroethyl Ether <sup>c</sup>	0	--	--	na	5.3E+00	--	--	na	4.6E+02	--	--	na	5.3E-01	--	--	na	4.6E+01	--	--	na	4.6E+01
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	1.6E+06	--	--	na	6.5E+03	--	--	na	1.6E+05	--	--	na	1.6E+05
Bis 2-Ethylhexyl Phthalate <sup>c</sup>	0	--	--	na	2.2E+01	--	--	na	1.9E+03	--	--	na	2.2E+00	--	--	na	1.9E+02	--	--	na	1.9E+02
Bromoform <sup>c</sup>	0	--	--	na	1.4E+03	--	--	na	1.2E+05	--	--	na	1.4E+02	--	--	na	1.2E+04	--	--	na	1.2E+04
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	4.6E+04	--	--	na	1.9E+02	--	--	na	4.6E+03	--	--	na	4.6E+03
Cadmium	0	3.0E+00	9.5E-01	na	--	3.0E+01	1.1E+01	na	--	7.6E-01	2.4E-01	na	--	7.6E+00	2.7E+00	na	--	7.6E+00	2.7E+00	na	--
Carbon Tetrachloride <sup>c</sup>	0	--	--	na	1.6E+01	--	--	na	1.4E+03	--	--	na	1.6E+00	--	--	na	1.4E+02	--	--	na	1.4E+02
Chlordane <sup>c</sup>	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+01	4.9E-02	na	7.0E-01	6.0E-01	1.1E-03	na	8.1E-04	6.0E+00	1.2E-02	na	7.0E-02	6.0E+00	1.2E-02	na	7.0E-02
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+06	2.6E+06	na	--	2.2E+05	5.8E+04	na	--	2.2E+06	6.6E+05	na	--	2.2E+06	6.6E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+02	1.3E+02	na	--	4.8E+00	2.8E+00	na	--	4.8E+01	3.2E+01	na	--	4.8E+01	3.2E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	3.8E+04	--	--	na	1.6E+02	--	--	na	3.8E+03	--	--	na	3.8E+03

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane <sup>c</sup>	0	--	--	na	1.3E+02	--	--	na	1.1E+04	--	--	na	1.3E+01	--	--	na	1.1E+03	--	--	na	1.1E+03
Chloroform	0	--	--	na	1.1E+04	--	--	na	2.6E+05	--	--	na	1.1E+03	--	--	na	2.6E+04	--	--	na	2.6E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	3.8E+04	--	--	na	1.6E+02	--	--	na	3.8E+03	--	--	na	3.8E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	3.6E+03	--	--	na	1.5E+01	--	--	na	3.6E+02	--	--	na	3.6E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-01	4.7E-01	na	--	2.1E-02	1.0E-02	na	--	2.1E-01	1.2E-01	na	--	2.1E-01	1.2E-01	na	--
Chromium III	0	4.7E+02	6.2E+01	na	--	4.7E+03	7.1E+02	na	--	1.2E+02	1.5E+01	na	--	1.2E+03	1.8E+02	na	--	1.2E+03	1.8E+02	na	--
Chromium VI	0	1.8E+01	1.1E+01	na	--	1.6E+02	1.3E+02	na	--	4.0E+00	2.8E+00	na	--	4.0E+01	3.2E+01	na	--	4.0E+01	3.2E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	2.4E+02	--	--	--	na	--
Chrysene <sup>c</sup>	0	--	--	na	1.8E-02	--	--	na	1.8E+00	--	--	na	1.8E-03	--	--	na	1.8E-01	--	--	na	1.8E-01
Copper	0	1.1E+01	7.4E+00	na	--	1.1E+02	8.5E+01	na	--	2.7E+00	1.9E+00	na	--	2.7E+01	2.1E+01	na	--	2.7E+01	2.1E+01	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+02	6.0E+01	na	3.8E+05	5.5E+00	1.3E+00	na	1.6E+03	5.5E+01	1.5E+01	na	3.8E+04	5.5E+01	1.5E+01	na	3.8E+04
DDD <sup>c</sup>	0	--	--	na	3.1E-03	--	--	na	2.7E-01	--	--	na	3.1E-04	--	--	na	2.7E-02	--	--	na	2.7E-02
DDE <sup>c</sup>	0	--	--	na	2.2E-03	--	--	na	1.9E-01	--	--	na	2.2E-04	--	--	na	1.9E-02	--	--	na	1.9E-02
DDT <sup>c</sup>	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+01	1.2E-02	na	1.9E-01	2.8E-01	2.5E-04	na	2.2E-04	2.8E+00	2.9E-03	na	1.9E-02	2.8E+00	2.9E-03	na	1.9E-02
Demeton	0	--	1.0E-01	na	--	--	1.2E+00	na	--	--	2.5E-02	na	--	--	2.9E-01	na	--	--	2.9E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E+00	2.0E+00	na	--	4.3E-02	4.3E-02	na	--	4.3E-01	4.9E-01	na	--	4.3E-01	4.9E-01	na	--
Biphenyl(a,h)anthracene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	1.8E+01	--	--	na	1.8E-02	--	--	na	1.6E+00	--	--	na	1.6E+00
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	3.1E+04	--	--	na	1.3E+02	--	--	na	3.1E+03	--	--	na	3.1E+03
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	2.3E+04	--	--	na	9.6E+01	--	--	na	2.3E+03	--	--	na	2.3E+03
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	4.6E+03	--	--	na	1.9E+01	--	--	na	4.6E+02	--	--	na	4.6E+02
3,3-Dichlorobenzidine <sup>c</sup>	0	--	--	na	2.8E-01	--	--	na	2.4E+01	--	--	na	2.8E-02	--	--	na	2.4E+00	--	--	na	2.4E+00
Dichlorobromomethane <sup>c</sup>	0	--	--	na	1.7E+02	--	--	na	1.5E+04	--	--	na	1.7E+01	--	--	na	1.5E+03	--	--	na	1.5E+03
1,2-Dichloroethane <sup>c</sup>	0	--	--	na	3.7E+02	--	--	na	3.2E+04	--	--	na	3.7E+01	--	--	na	3.2E+03	--	--	na	3.2E+03
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	1.7E+05	--	--	na	7.1E+02	--	--	na	1.7E+04	--	--	na	1.7E+04
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	2.4E+05	--	--	na	1.0E+03	--	--	na	2.4E+04	--	--	na	2.4E+04
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	7.0E+03	--	--	na	2.9E+01	--	--	na	7.0E+02	--	--	na	7.0E+02
2,4-Dichlorophenoxyacetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,2-Dichloropropane <sup>c</sup>	0	--	--	na	1.5E+02	--	--	na	1.3E+04	--	--	na	1.5E+01	--	--	na	1.3E+03	--	--	na	1.3E+03
1,3-Dichloropropene <sup>c</sup>	0	--	--	na	2.1E+02	--	--	na	1.8E+04	--	--	na	2.1E+01	--	--	na	1.8E+03	--	--	na	1.8E+03
Dieldrin <sup>c</sup>	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E+00	6.4E-01	na	4.7E-02	6.0E-02	1.4E-02	na	5.4E-05	6.0E-01	1.6E-01	na	4.7E-03	6.0E-01	1.6E-01	na	4.7E-03
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	1.1E+06	--	--	na	4.4E+03	--	--	na	1.1E+05	--	--	na	1.1E+05
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	2.0E+04	--	--	na	8.5E+01	--	--	na	2.0E+03	--	--	na	2.0E+03
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	2.6E+07	--	--	na	1.1E+05	--	--	na	2.6E+06	--	--	na	2.6E+06
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	1.1E+05	--	--	na	4.5E+02	--	--	na	1.1E+04	--	--	na	1.1E+04
2,4-Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	1.3E+05	--	--	na	5.3E+02	--	--	na	1.3E+04	--	--	na	1.3E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	6.7E+03	--	--	na	2.8E+01	--	--	na	6.7E+02	--	--	na	6.7E+02
2,4-Dinitrotoluene <sup>c</sup>	0	--	--	na	3.4E+01	--	--	na	2.9E+03	--	--	na	3.4E+00	--	--	na	2.9E+02	--	--	na	2.9E+02
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	1.2E-05	--	--	na	5.1E-09	--	--	na	1.2E-07	--	--	na	1.2E-07
1,2-Diphenylhydrazine <sup>c</sup>	0	--	--	na	2.0E+00	--	--	na	1.7E+02	--	--	na	2.0E-01	--	--	na	1.7E+01	--	--	na	1.7E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E+00	6.4E-01	na	2.1E+03	5.5E-02	1.4E-02	na	8.9E+00	5.5E-01	1.6E-01	na	2.1E+02	5.5E-01	1.6E-01	na	2.1E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E+00	6.4E-01	na	2.1E+03	5.5E-02	1.4E-02	na	8.9E+00	5.5E-01	1.6E-01	na	2.1E+02	5.5E-01	1.6E-01	na	2.1E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E+00	6.4E-01	--	--	5.5E-02	1.4E-02	--	--	5.5E-01	1.6E-01	--	--	5.5E-01	1.6E-01	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	2.1E+03	--	--	na	8.9E+00	--	--	na	2.1E+02	--	--	na	2.1E+02
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-01	4.1E-01	na	1.4E+00	2.2E-02	9.0E-03	na	6.0E-03	2.2E-01	1.0E-01	na	1.4E-01	2.2E-01	1.0E-01	na	1.4E-01
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	7.2E+00	--	--	na	3.0E-02	--	--	na	7.2E-01	--	--	na	7.2E-01

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	-	-	na	2.1E+03	-	-	na	5.0E+04	-	-	na	2.1E+02	-	-	na	5.0E+03	--	--	na	5.0E+03
Fluoranthene	0	-	--	na	1.4E+02	--	--	na	3.4E+03	-	-	na	1.4E+01	--	--	na	3.4E+02	--	--	na	3.4E+02
Fluorene	0	-	--	na	5.3E+03	-	-	na	1.3E+05	-	-	na	5.3E+02	-	-	na	1.3E+04	--	--	na	1.3E+04
Foaming Agents	0	-	--	na	-	-	-	na	-	-	-	na	-	-	-	na	-	--	--	na	--
Guthion	0	-	1.0E-02	na	-	-	1.2E-01	na	-	-	2.5E-03	na	-	-	2.9E-02	na	-	-	2.9E-02	na	--
Heptachlor <sup>c</sup>	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E+00	4.4E-02	na	6.8E-02	1.3E-01	9.5E-04	na	7.9E-05	1.3E+00	1.1E-02	na	6.8E-03	1.3E+00	1.1E-02	na	6.8E-03
Heptachlor Epoxide <sup>c</sup>	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E+00	4.4E-02	na	3.4E-02	1.3E-01	9.5E-04	na	3.9E-05	1.3E+00	1.1E-02	na	3.4E-03	1.3E+00	1.1E-02	na	3.4E-03
Hexachlorobenzene <sup>c</sup>	0	-	-	na	2.9E-03	-	-	na	2.5E-01	-	-	na	2.9E-04	-	-	na	2.5E-02	--	--	na	2.5E-02
Hexachlorobutadiene <sup>c</sup>	0	-	--	na	1.8E+02	-	-	na	1.6E+04	-	-	na	1.8E+01	-	-	na	1.6E+03	--	--	na	1.6E+03
Hexachlorocyclohexane	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-
Alpha-BHC <sup>c</sup>	0	-	--	na	4.9E-02	-	-	na	4.2E+00	-	-	na	4.9E-03	-	-	na	4.2E-01	--	--	na	4.2E-01
Hexachlorocyclohexane	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-
Gamma-BHC <sup>c</sup> (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E+00	-	na	1.6E+02	2.4E-01	-	na	1.8E-01	2.4E+00	-	na	1.6E+01	2.4E+00	--	na	1.6E+01
Hexachlorocyclopentadiene	0	-	-	na	1.1E+03	-	-	na	2.6E+04	-	-	na	1.1E+02	-	-	na	2.6E+03	--	--	na	2.6E+03
Hexachloroethane <sup>c</sup>	0	-	--	na	3.3E+01	-	-	na	2.9E+03	-	-	na	3.3E+00	-	-	na	2.9E+02	--	--	na	2.9E+02
Hydrogen Sulfide	0	-	2.0E+00	na	-	-	2.3E+01	na	-	-	5.0E-01	na	--	-	5.8E+00	na	--	--	5.8E+00	na	--
Indeno (1,2,3-cd) pyrene <sup>c</sup>	0	-	-	na	1.8E-01	-	--	na	1.6E+01	-	-	na	1.8E-02	-	-	na	1.6E+00	--	--	na	1.6E+00
Iron	0	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-
Isophorone <sup>c</sup>	0	-	--	na	9.6E+03	-	-	na	8.3E+05	-	-	na	9.6E+02	-	-	na	8.3E+04	--	--	na	8.3E+04
Kepone	0	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	--	-	0.0E+00	na	-	-	0.0E+00	na	--
Lead	0	9.0E+01	1.0E+01	na	-	9.0E+02	1.2E+02	na	-	2.2E+01	2.5E+00	na	-	2.2E+02	2.9E+01	na	-	2.2E+02	2.9E+01	na	--
Malathion	0	-	1.0E-01	na	-	-	1.2E+00	na	-	-	2.5E-02	na	-	-	2.9E-01	na	-	-	2.9E-01	na	--
Manganese	0	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-
Mercury	0	1.4E+00	7.7E-01	--	-	1.4E+01	8.9E+00	--	--	3.5E-01	1.9E-01	--	-	3.5E+00	2.2E+00	--	-	3.5E+00	2.2E+00	--	--
Methyl Bromide	0	-	--	na	1.5E+03	-	-	na	3.6E+04	-	-	na	1.5E+02	-	-	na	3.6E+03	--	--	na	3.6E+03
Methylene Chloride <sup>c</sup>	0	-	--	na	5.9E+03	-	-	na	5.1E+05	-	-	na	5.9E+02	-	-	na	5.1E+04	--	--	na	5.1E+04
Methoxychlor	0	-	3.0E-02	na	-	-	3.5E-01	na	-	-	7.5E-03	na	-	-	8.6E-02	na	-	-	8.6E-02	na	--
Mirex	0	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	--
Nickel	0	1.5E+02	1.7E+01	na	4.6E+03	1.5E+03	1.9E+02	na	1.1E+05	3.8E+01	4.2E+00	na	4.6E+02	3.8E+02	4.8E+01	na	1.1E+04	3.8E+02	4.8E+01	na	1.1E+04
Nitrate (as N)	0	-	--	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	--
Nitrobenzene	0	-	-	na	6.9E+02	-	-	na	1.7E+04	-	-	na	6.9E+01	-	-	na	1.7E+03	--	--	na	1.7E+03
N-Nitrosodimethylamine <sup>c</sup>	0	-	--	na	3.0E+01	-	-	na	2.6E+03	-	-	na	3.0E+00	-	-	na	2.6E+02	--	--	na	2.6E+02
N-Nitrosodiphenylamine <sup>c</sup>	0	-	--	na	6.0E+01	-	-	na	5.2E+03	-	-	na	6.0E+00	-	-	na	5.2E+02	--	--	na	5.2E+02
N-Nitrosodi-n-propylamine <sup>c</sup>	0	-	--	na	5.1E+00	-	-	na	4.4E+02	-	-	na	5.1E-01	-	-	na	4.4E+01	--	--	na	4.4E+01
Nonylphenol	0	2.6E+01	6.6E+00	-	2.8E+02	7.6E+01	na	-	7.0E+00	1.7E+00	-	7.0E+01	1.9E+01	-	-	7.0E+01	1.9E+01	-	-	7.0E+01	1.9E+01
Parathion	0	6.5E-02	1.3E-02	na	-	6.5E-01	1.5E-01	na	-	1.6E-02	3.3E-03	na	-	1.6E-01	3.7E-02	na	-	1.6E-01	3.7E-02	na	--
PCB Total <sup>c</sup>	0	-	1.4E-02	na	6.4E-04	-	1.6E-01	na	5.5E-02	-	3.5E-03	na	6.4E-05	-	4.0E-02	na	5.5E-03	--	4.0E-02	na	5.5E-03
Pentachlorophenol <sup>c</sup>	0	6.3E+00	4.9E+00	na	3.0E+01	6.3E+01	5.6E+01	na	2.6E+03	1.6E+00	1.2E+00	na	3.0E+00	1.6E+01	1.4E+01	na	2.6E+02	1.6E+01	1.4E+01	na	2.6E+02
Phenol	0	-	-	na	8.6E+05	-	-	na	2.1E+07	-	-	na	8.6E+04	-	-	na	2.1E+06	--	--	na	2.1E+06
Pyrene	0	-	-	na	4.0E+03	-	-	na	9.6E+04	-	-	na	4.0E+02	-	-	na	9.6E+03	--	--	na	9.6E+03
Radionuclides	0	-	-	na	--	-	-	na	--	-	-	na	-	-	-	na	-	-	-	na	-
Gross Alpha Activity (pCi/L)	0	-	-	na	--	-	-	na	--	-	-	na	-	-	-	na	-	-	-	na	-
Beta and Photon Activity (mrem/yr)	0	-	-	na	--	-	-	na	--	-	-	na	-	-	-	na	-	-	-	na	-
Radium 226 + 228 (pCi/L)	0	-	-	na	--	-	-	na	--	-	-	na	-	-	-	na	-	-	-	na	-
Uranium (ug/l)	0	-	-	na	--	-	-	na	--	-	-	na	-	-	-	na	-	-	-	na	-

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+02	5.8E+01	na	1.0E+05	5.0E+00	1.3E+00	na	4.2E+02	5.0E+01	1.4E+01	na	1.0E+04	5.0E+01	1.4E+01	na	1.0E+04
Silver	0	2.4E+00	--	na	--	2.4E+01	--	na	--	5.9E-01	--	na	--	5.9E+00	--	na	--	5.9E+00	--	na	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane <sup>c</sup>	0	--	--	na	4.0E+01	--	--	na	3.5E+03	--	--	na	4.0E+00	--	--	na	3.5E+02	--	--	na	3.5E+02
Tetrachloroethylene <sup>c</sup>	0	--	--	na	3.3E+01	--	--	na	2.9E+03	--	--	na	3.3E+00	--	--	na	2.9E+02	--	--	na	2.9E+02
Thallium	0	--	--	na	4.7E-01	--	--	na	1.1E+01	--	--	na	4.7E-02	--	--	na	1.1E+00	--	--	na	1.1E+00
Toluene	0	--	--	na	6.0E+03	--	--	na	1.4E+05	--	--	na	6.0E+02	--	--	na	1.4E+04	--	--	na	1.4E+04
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Toxaphene <sup>c</sup>	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E+00	2.3E-03	na	2.4E-01	1.8E-01	5.0E-05	na	2.8E-04	1.8E+00	5.8E-04	na	2.4E-02	1.8E+00	5.8E-04	na	2.4E-02
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E+00	8.3E-01	na	--	1.2E-01	1.8E-02	na	--	1.2E+00	2.1E-01	na	--	1.2E+00	2.1E-01	na	--
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	1.7E+03	--	--	na	7.0E+00	--	--	na	1.7E+02	--	--	na	1.7E+02
1,1,2-Trichloroethane <sup>c</sup>	0	--	--	na	1.6E+02	--	--	na	1.4E+04	--	--	na	1.6E+01	--	--	na	1.4E+03	--	--	na	1.4E+03
Trichloroethylene <sup>c</sup>	0	--	--	na	3.0E+02	--	--	na	2.6E+04	--	--	na	3.0E+01	--	--	na	2.6E+03	--	--	na	2.6E+03
2,4,6-Trichlorophenol <sup>c</sup>	0	--	--	na	2.4E+01	--	--	na	2.1E+03	--	--	na	2.4E+00	--	--	na	2.1E+02	--	--	na	2.1E+02
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Vinyl Chloride <sup>c</sup>	0	--	--	na	2.4E+01	--	--	na	2.1E+03	--	--	na	2.4E+00	--	--	na	2.1E+02	--	--	na	2.1E+02
Zinc	0	9.7E+01	9.8E+01	na	2.6E+04	9.7E+02	1.1E+03	na	6.2E+05	2.4E+01	2.4E+01	na	2.6E+03	2.4E+02	2.8E+02	na	6.2E+04	2.4E+02	2.8E+02	na	6.2E+04

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipal
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic  
= (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.5E+03
Arsenic	2.6E+02
Barium	na
Cadmium	1.6E+00
Chromium III	1.1E+02
Chromium VI	1.6E+01
Copper	1.1E+01
Iron	na
Lead	1.8E+01
Manganese	na
Mercury	1.3E+00
Nickel	2.9E+01
Selenium	8.6E+00
Silver	2.4E+00
Zinc	9.7E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

MODOUT 0.02 mgd.TXT  
"Model Run For C:\Documents and Settings\pvu61777\My Documents\000\_kaharlow\Franklin County Commerce Center WWTP - VA0091103\VA0091103\_12\Technical\Regional Model - 0.02 MGD - chronic ammonia.mod On 7/12/2012 1:20:53 PM"

"Model is for NORTH FORK OF LITTLE CHESTNUT CREEK."  
"Model starts at the FRANKLIN COUNTY COMMERCE CENTER WWTP discharge."

"Background Data"  
"7Q10", "cBOD5", "TKN", "DO", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.2068, 2, 0, 7.575, 22.3

"Discharge/Tributary Input Data for Segment 1"  
"Flow", "cBOD5", "TKN", "DO", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.02, 30, 9, 5.31, 22.3

"Hydraulic Information for Segment 1"  
"Length", "Width", "Depth", "Velocity"  
"(mi)", "(ft)", "(ft)", "(ft/sec)"  
.308, 3, .171, .682

"Initial Mix Values for Segment 1"  
"Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.2268, 7.375, 11.173, 2.291, 8.418, 22.3

"Rate Constants for Segment 1. - (All units Per Day)"  
"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
1, 1.111, 17.532, 18.515, .25, .298, 0, 0

"Output for Segment 1"  
"Segment starts at FRANKLIN COUNTY COMMERCE CENTER WWTP"  
"Total", "Segm."  
"Dist.", "Dist.", "DO", "cBOD", "nBOD"  
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
0, 0, 7.375, 11.173, 2.291  
.1, .1, 7.427, 11.062, 2.285  
.2, .2, 7.472, 10.952, 2.279  
.308, .308, 7.514, 10.835, 2.272

"END OF FILE"

Stats - TRC 0.02.txt

7/12/2012 2:01:16 PM

Facility = Franklin Co Comm Ctr VA0091103  
Chemical = TRC  
Chronic averaging period = 4  
WLAA = 48  
WLAC = 32  
Q.L. = 100  
# samples/mo. = 30  
# samples/wk. = 8

Summary of Statistics:

# observations = 1  
Expected Value = 4000  
Variance = 5760000  
C.V. = 0.6  
97th percentile daily values = 9733.67  
97th percentile 4 day average = 6655.16  
97th percentile 30 day average= 4824.21  
# < Q.L. = 0  
Model used = BP3 Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 46.8023930897034  
Average Weekly limit = 27.9178655104031  
Average Monthly Limit = 23.1962565349114

The data are:

4000

Stats - Ammonia 0.02.txt

7/12/2012 1:55:14 PM

Facility = Franklin Co Comm Ctr VA0091103  
Chemical = Ammonia  
Chronic averaging period = 30  
WLAA = 16  
WLAC = 4.8  
Q.L. = 0.2  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 1  
Expected Value = 9  
Variance = 29.16  
C.V. = 0.6  
97th percentile daily values = 21.9007  
97th percentile 4 day average = 14.9741  
97th percentile 30 day average= 10.8544  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 9.68481644839829  
Average Weekly limit = 9.68481644839829  
Average Monthly Limit = 9.68481644839829

The data are:

## **Attachment G**

### **Wasteload and Limit Calculations – 0.0399 MGD**

- Mixing Zone Calculations (MIXER)
- Wasteload Allocation Spreadsheet
  - STATS Program Results
- Regional Water Quality Model (v4.11)

## Mixing Zone Predictions for

## Franklin County County Commerce Center WWTP

Effluent Flow = 0.0399 MGD  
Stream 7Q10 = 0.21 MGD  
Stream 30Q10 = 0.33 MGD  
Stream 1Q10 = 0.18 MGD  
Stream slope = 0.005517 ft/ft  
Stream width = 4 ft  
Bottom scale = 3  
Channel scale = 1

---

### Mixing Zone Predictions @ 7Q10

Depth = .2574 ft  
Length = 43.67 ft  
Velocity = .3756 ft/sec  
Residence Time = .0013 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

---

### Mixing Zone Predictions @ 30Q10

Depth = .3299 ft  
Length = 34.77 ft  
Velocity = .4339 ft/sec  
Residence Time = .0009 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

---

### Mixing Zone Predictions @ 1Q10

Depth = .2376 ft  
Length = 46.97 ft  
Velocity = .3582 ft/sec  
Residence Time = .0364 hours

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

---

**FRESHWATER**  
**WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS**

Facility Name: Franklin County Commerce Center WWTP

Permit No.: VA0091103

Receiving Stream: North Fork of Little Chestnut Creek

Version: OWP Guidance Memo 00-2011 (8/24/00)

**Stream Information**

Mean Hardness (as CaCO<sub>3</sub>) = 80 mg/L  
90% Temperature (Annual) = 22.3 deg C  
90% Temperature (Wet season) = 22.3 deg C  
90% Maximum pH = 8.28 SU  
10% Maximum pH = 6.67 SU  
Tier Designation (1 or 2) = 2  
Public Water Supply (PWS) Y/N? = n  
Trout Present Y/N? = n  
Early Life Stages Present Y/N? = y

**Stream Flows**

1Q10 (Annual) = 0.18 MGD  
7Q10 (Annual) = 0.21 MGD  
30Q10 (Annual) = 0.33 MGD  
1Q10 (Wet season) = 0.81 MGD  
30Q10 (Wet season) = 1.29 MGD  
30Q5 = 0.46 MGD  
Harmonic Mean = 1.71 MGD

**Mixing Information**

Annual - 1Q10 Mix = 100 %  
- 7Q10 Mix = 100 %  
- 30Q10 Mix = 100 %  
Wet Season - 1Q10 Mix = 100 %  
- 30Q10 Mix = 100 %

**Effluent Information**

Mean Hardness (as CaCO<sub>3</sub>) = 60 mg/L  
90% Temp (Annual) = 22.3 deg C  
90% Temp (Wet season) = 22.3 deg C  
90% Maximum pH = 7.6 SU  
10% Maximum pH = 6.8 SU  
Discharge Flow = 0.0399 MGD

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	--	--	na	9.9E+02	--	--	na	1.2E+04	--	--	na	9.9E+01	--	--	na	1.2E+03	--	--	na	1.2E+03
Acrolein	0	--	--	na	9.3E+00	--	--	na	1.2E+02	--	--	na	9.3E-01	--	--	na	1.2E+01	--	--	na	1.2E+01
Acrylonitrile <sup>c</sup>	0	--	--	na	2.5E+00	--	--	na	1.1E+02	--	--	na	2.5E-01	--	--	na	1.1E+01	--	--	na	1.1E+01
Aldrin <sup>c</sup>	0	3.0E+00	--	na	5.0E-04	1.7E+01	--	na	2.2E-02	7.5E-01	--	na	5.0E-05	4.1E+00	--	na	2.2E-03	4.1E+00	--	na	2.2E-03
Ammonia-N (mg/l) (Yearly)	0	7.60E+00	1.21E+00	na	--	4.19E+01	1.12E+01	na	--	1.80E+00	3.03E-01	na	--	1.05E+01	2.80E+00	na	--	1.05E+01	2.80E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	5.63E+00	1.03E+00	na	--	1.20E+02	3.43E+01	na	--	1.41E+00	2.57E-01	na	--	3.00E+01	8.58E+00	na	--	3.00E+01	8.58E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	5.0E+05	--	--	na	4.0E+03	--	--	na	5.0E+04	--	--	na	5.0E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	8.0E+03	--	--	na	6.4E+01	--	--	na	8.0E+02	--	--	na	8.0E+02
Arsenic	0	3.4E+02	1.5E+02	na	--	1.9E+03	9.4E+02	na	--	8.5E+01	3.8E+01	na	--	4.7E+02	2.3E+02	na	--	4.7E+02	2.3E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	na	--	--	--	--	--	--
Benzene <sup>c</sup>	0	--	--	na	5.1E+02	--	--	na	2.2E+04	--	--	na	5.1E+01	--	--	na	2.2E+03	--	--	na	2.2E+03
Benzidine <sup>c</sup>	0	--	--	na	2.0E-03	--	--	na	8.8E-02	--	--	na	2.0E-04	--	--	na	8.8E-03	--	--	na	8.8E-03
Benzo (a) anthracene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	7.9E+00	--	--	na	1.8E-02	--	--	na	7.9E-01	--	--	na	7.9E-01
Benzo (b) fluoranthene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	7.9E+00	--	--	na	1.8E-02	--	--	na	7.9E-01	--	--	na	7.9E-01
Benzo (k) fluoranthene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	7.9E+00	--	--	na	1.8E-02	--	--	na	7.9E-01	--	--	na	7.9E-01
Benzo (a) pyrene <sup>c</sup>	0	--	--	na	1.8E-01	--	--	na	7.9E+00	--	--	na	1.8E-02	--	--	na	7.9E-01	--	--	na	7.9E-01
Bis(2-Chloroethyl) Ether <sup>c</sup>	0	--	--	na	5.3E+00	--	--	na	2.3E+02	--	--	na	5.3E-01	--	--	na	2.3E+01	--	--	na	2.3E+01
Bis(2-Chloroisopropyl) Ether	0	--	--	na	6.5E+04	--	--	na	8.1E+05	--	--	na	6.5E+03	--	--	na	8.1E+04	--	--	na	8.1E+04
Bis(2-Ethylhexyl) Phthalate <sup>c</sup>	0	--	--	na	2.2E+01	--	--	na	9.6E+02	--	--	na	2.2E+00	--	--	na	9.6E+01	--	--	na	9.6E+01
Bromofom <sup>c</sup>	0	--	--	na	1.4E+03	--	--	na	6.1E+04	--	--	na	1.4E+02	--	--	na	6.1E+03	--	--	na	6.1E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	2.4E+04	--	--	na	1.9E+02	--	--	na	2.4E+03	--	--	na	2.4E+03
Cadmium	0	3.0E+00	9.5E-01	na	--	1.7E+01	6.0E+00	na	--	7.6E-01	2.4E-01	na	--	4.2E+00	1.5E+00	na	--	4.2E+00	1.5E+00	na	--
Carbon Tetrachloride <sup>c</sup>	0	--	--	na	1.6E+01	--	--	na	7.0E+02	--	--	na	1.6E+00	--	--	na	7.0E+01	--	--	na	7.0E+01
Chlordane <sup>c</sup>	0	2.4E+00	4.3E-03	na	8.1E-03	1.3E+01	2.7E-02	na	3.6E-01	6.0E-01	1.1E-03	na	8.1E-04	3.3E+00	6.7E-03	na	3.6E-02	3.3E+00	6.7E-03	na	3.6E-02
Chloride	0	8.6E+05	2.3E+05	na	--	4.7E+06	1.4E+06	na	--	2.2E+05	5.8E+04	na	--	1.2E+06	3.6E+05	na	--	1.2E+06	3.6E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.0E+02	6.9E+01	na	--	4.8E+00	2.8E+00	na	--	2.6E+01	1.7E+01	na	--	2.6E+01	1.7E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	2.0E+04	--	--	na	1.6E+02	--	--	na	2.0E+03	--	--	na	2.0E+03

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane <sup>c</sup>	0	-	-	na	1.3E+02	-	-	na	5.7E+03	-	-	na	1.3E+01	-	-	na	5.7E+02	-	-	na	5.7E+02
Chloroform	0	-	-	na	1.1E+04	-	-	na	1.4E+05	-	-	na	1.1E+03	-	-	na	1.4E+04	-	-	na	1.4E+04
2-Chloronaphthalene	0	-	-	na	1.6E+03	-	-	na	2.0E+04	-	-	na	1.6E+02	-	-	na	2.0E+03	-	-	na	2.0E+03
2-Chlorophenol	0	-	-	na	1.5E+02	-	-	na	1.9E+03	-	-	na	1.5E+01	-	-	na	1.9E+02	-	-	na	1.9E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	-	4.6E-01	2.6E-01	na	-	2.1E-02	1.0E-02	na	-	1.1E-01	6.4E-02	na	-	1.1E-01	6.4E-02	na	-
Chromium III	0	4.7E+02	6.2E+01	na	-	2.6E+03	3.9E+02	na	-	1.2E+02	1.5E+01	na	-	6.5E+02	9.7E+01	na	-	6.5E+02	9.7E+01	na	-
Chromium VI	0	1.6E+01	1.1E+01	na	-	8.8E+01	6.9E+01	na	-	4.0E+00	2.8E+00	na	-	2.2E+01	1.7E+01	na	-	2.2E+01	1.7E+01	na	-
Chromium, Total	0	-	-	1.0E+02	-	-	-	na	-	-	-	1.0E+01	-	-	-	1.3E+02	-	-	-	na	-
Chrysene <sup>c</sup>	0	-	-	na	1.8E-02	-	-	na	7.9E-01	-	-	na	1.8E-03	-	-	na	7.9E-02	-	-	na	7.9E-02
Copper	0	1.1E+01	7.4E+00	na	-	6.0E+01	4.6E+01	na	-	2.7E+00	1.9E+00	na	-	1.5E+01	1.2E+01	na	-	1.5E+01	1.2E+01	na	-
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	1.2E+02	3.3E+01	na	2.0E+05	5.5E+00	1.3E+00	na	1.6E+03	3.0E+01	8.1E+00	na	2.0E+04	3.0E+01	8.1E+00	na	2.0E+04
DDD <sup>c</sup>	0	-	-	na	3.1E-03	-	-	na	1.4E-01	-	-	na	3.1E-04	-	-	na	1.4E-02	-	-	na	1.4E-02
DDE <sup>c</sup>	0	-	-	na	2.2E-03	-	-	na	9.6E-02	-	-	na	2.2E-04	-	-	na	9.6E-03	-	-	na	9.6E-03
DDT <sup>c</sup>	0	1.1E+00	1.0E-03	na	2.2E-03	6.1E+00	6.3E-03	na	9.6E-02	2.8E-01	2.5E-04	na	2.2E-04	1.5E+00	1.6E-03	na	9.6E-03	1.5E+00	1.6E-03	na	9.6E-03
Demeton	0	-	-	1.0E-01	na	-	-	6.3E-01	na	-	-	2.5E-02	na	-	-	1.6E-01	na	-	-	1.6E-01	-
Diazinon	0	1.7E-01	1.7E-01	na	-	9.4E-01	1.1E+00	na	-	4.3E-02	4.3E-02	na	-	2.3E-01	2.7E-01	na	-	2.3E-01	2.7E-01	na	-
Dibenz(a,h)anthracene <sup>c</sup>	0	-	-	na	1.8E-01	-	-	na	7.9E+00	-	-	na	1.8E-02	-	-	na	7.9E-01	-	-	na	7.9E-01
1,2-Dichlorobenzene	0	-	-	na	1.3E+03	-	-	na	1.6E+04	-	-	na	1.3E+02	-	-	na	1.6E+03	-	-	na	1.6E+03
1,3-Dichlorobenzene	0	-	-	na	9.6E+02	-	-	na	1.2E+04	-	-	na	9.6E+01	-	-	na	1.2E+03	-	-	na	1.2E+03
1,4-Dichlorobenzene	0	-	-	na	1.9E+02	-	-	na	2.4E+03	-	-	na	1.9E+01	-	-	na	2.4E+02	-	-	na	2.4E+02
3,3-Dichlorobenzidine <sup>c</sup>	0	-	-	na	2.8E-01	-	-	na	1.2E+01	-	-	na	2.8E-02	-	-	na	1.2E+00	-	-	na	1.2E+00
Dichlorobromomethane <sup>c</sup>	0	-	-	na	1.7E+02	-	-	na	7.5E+03	-	-	na	1.7E+01	-	-	na	7.5E+02	-	-	na	7.5E+02
1,2-Dichloroethane <sup>c</sup>	0	-	-	na	3.7E+02	-	-	na	1.6E+04	-	-	na	3.7E+01	-	-	na	1.6E+03	-	-	na	1.6E+03
1,1-Dichloroethylene	0	-	-	na	7.1E+03	-	-	na	8.9E+04	-	-	na	7.1E+02	-	-	na	8.9E+03	-	-	na	8.9E+03
1,2-trans-dichloroethylene	0	-	-	na	1.0E+04	-	-	na	1.3E+05	-	-	na	1.0E+03	-	-	na	1.3E+04	-	-	na	1.3E+04
2,4-Dichlorophenol	0	-	-	na	2.9E+02	-	-	na	3.6E+03	-	-	na	2.9E+01	-	-	na	3.6E+02	-	-	na	3.6E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-
1,2-Dichloropropane <sup>c</sup>	0	-	-	na	1.5E+02	-	-	na	6.6E+03	-	-	na	1.5E+01	-	-	na	6.6E+02	-	-	na	6.6E+02
1,3-Dichloropropane <sup>c</sup>	0	-	-	na	2.1E+02	-	-	na	9.2E+03	-	-	na	2.1E+01	-	-	na	9.2E+02	-	-	na	9.2E+02
Dieldrin <sup>c</sup>	0	2.4E-01	5.6E-02	na	5.4E-04	1.3E+00	3.5E-01	na	2.4E-02	6.0E-02	1.4E-02	na	5.4E-05	3.3E-01	8.8E-02	na	2.4E-03	3.3E-01	8.8E-02	na	2.4E-03
Diethyl Phthalate	0	-	-	na	4.4E+04	-	-	na	5.5E+05	-	-	na	4.4E+03	-	-	na	5.5E+04	-	-	na	5.5E+04
2,4-Dimethylphenol	0	-	-	na	8.5E+02	-	-	na	1.1E+04	-	-	na	8.5E+01	-	-	na	1.1E+03	-	-	na	1.1E+03
Dimethyl Phthalate	0	-	-	na	1.1E+06	-	-	na	1.4E+07	-	-	na	1.1E+05	-	-	na	1.4E+06	-	-	na	1.4E+06
Di-n-Butyl Phthalate	0	-	-	na	4.5E+03	-	-	na	5.6E+04	-	-	na	4.5E+02	-	-	na	5.6E+03	-	-	na	5.6E+03
2,4 Dinitrophenol	0	-	-	na	5.3E+03	-	-	na	6.6E+04	-	-	na	5.3E+02	-	-	na	6.6E+03	-	-	na	6.6E+03
2-Methyl-4,6-Dinitrophenol	0	-	-	na	2.8E+02	-	-	na	3.5E+03	-	-	na	2.8E+01	-	-	na	3.5E+02	-	-	na	3.5E+02
2,4-Dinitrotoluene <sup>c</sup>	0	-	-	na	3.4E+01	-	-	na	1.5E+03	-	-	na	3.4E+00	-	-	na	1.5E+02	-	-	na	1.5E+02
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	-	-	na	5.1E-08	-	-	na	6.4E-07	-	-	na	5.1E-09	-	-	na	6.4E-08	-	-	na	6.4E-08
1,2-Diphenylhydrazine <sup>c</sup>	0	-	-	na	2.0E+00	-	-	na	8.8E+01	-	-	na	2.0E-01	-	-	na	8.8E+00	-	-	na	8.8E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.2E+00	3.5E-01	na	1.1E+03	5.5E-02	1.4E-02	na	8.9E+00	3.0E-01	8.8E-02	na	1.1E+02	3.0E-01	8.8E-02	na	1.1E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.2E+00	3.5E-01	na	1.1E+03	5.5E-02	1.4E-02	na	8.9E+00	3.0E-01	8.8E-02	na	1.1E+02	3.0E-01	8.8E-02	na	1.1E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	1.2E+00	3.5E-01	--	--	5.5E-02	1.4E-02	--	--	3.0E-01	8.8E-02	--	--	3.0E-01	8.8E-02	--	--
Endosulfan Sulfate	0	-	-	na	8.9E+01	-	-	na	1.1E+03	-	-	na	8.9E+00	-	-	na	1.1E+02	-	-	na	1.1E+02
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	4.7E-01	2.3E-01	na	7.5E-01	2.2E-02	9.0E-03	na	6.0E-03	1.2E-01	5.6E-02	na	7.5E-02	1.2E-01	5.6E-02	na	7.5E-02
Endrin Aldehyde	0	-	-	na	3.0E-01	-	-	na	3.8E+00	-	-	na	3.0E-02	-	-	na	3.8E-01	-	-	na	3.8E-01

Parameter (ug/l unless noted)	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				
		Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	-	--	--	na	2.1E+03	-	--	na	2.6E+04	-	--	na	2.1E+02	-	--	na	2.6E+03	-	--	na	2.6E+03
Fluoranthene	0	-	--	--	na	1.4E+02	-	--	na	1.8E+03	-	--	na	1.4E+01	-	--	na	1.8E+02	-	--	na	1.8E+02
Fluorene	0	-	--	--	na	5.3E+03	-	--	na	6.6E+04	-	--	na	5.3E+02	-	--	na	6.6E+03	-	--	na	6.6E+03
Foaming Agents	0	-	--	--	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-	--	na	-
Guthion	0	-	--	1.0E-02	na	-	-	6.3E-02	na	--	-	2.5E-03	na	-	--	1.6E-02	na	-	-	1.6E-02	na	-
Heptachlor <sup>c</sup>	0	5.2E-01	3.8E-03	na	7.9E-04	2.9E+00	2.4E-02	na	3.5E-02	1.3E-01	9.5E-04	na	7.9E-05	7.2E-01	6.0E-03	na	3.5E-03	7.2E-01	6.0E-03	na	3.5E-03	
Heptachlor Epoxide <sup>c</sup>	0	5.2E-01	3.8E-03	na	3.9E-04	2.9E+00	2.4E-02	na	1.7E-02	1.3E-01	9.5E-04	na	3.9E-05	7.2E-01	6.0E-03	na	1.7E-03	7.2E-01	6.0E-03	na	1.7E-03	
Hexachlorobenzene <sup>c</sup>	0	-	--	--	na	2.9E-03	-	--	na	1.3E-01	-	--	na	2.9E-04	-	--	na	1.3E-02	-	--	na	1.3E-02
Hexachlorobutadiene <sup>c</sup>	0	-	--	--	na	1.8E+02	-	--	na	7.9E+03	-	--	na	1.8E+01	-	--	na	7.9E+02	-	--	na	7.9E+02
Hexachlorocyclohexane	Alpha-BHC <sup>c</sup>	0	-	--	na	4.9E-02	-	--	na	2.1E+00	-	--	na	4.9E-03	-	--	na	2.1E-01	--	--	na	2.1E-01
Beta-BHC <sup>c</sup>	0	-	--	--	na	1.7E-01	-	--	na	7.5E+00	-	--	na	1.7E-02	-	--	na	7.5E-01	-	--	na	7.5E-01
Hexachlorocyclohexane	Gamma-BHC <sup>c</sup> (Lindane)	0	9.5E-01	na	na	1.8E+00	5.2E+00	-	na	7.9E+01	2.4E-01	--	na	1.8E-01	1.3E+00	-	na	7.9E+00	1.3E+00	--	na	7.9E+00
Hexachlorocyclopentadiene	0	-	--	--	na	1.1E+03	-	--	na	1.4E+04	-	--	na	1.1E+02	-	--	na	1.4E+03	--	--	na	1.4E+03
Hexachloroethane <sup>c</sup>	0	-	--	--	na	3.3E+01	-	--	na	1.4E+03	-	--	na	3.3E+00	-	--	na	1.4E+02	--	--	na	1.4E+02
Hydrogen Sulfide	0	-	--	2.0E+00	na	-	-	1.3E+01	na	-	--	5.0E-01	na	-	-	3.1E+00	na	--	--	3.1E+00	na	-
Indeno (1,2,3-cd) pyrene <sup>c</sup>	0	-	--	na	1.8E-01	-	--	na	7.9E+00	-	--	na	1.8E-02	-	--	na	7.9E-01	-	--	na	7.9E-01	
Iron	0	-	--	--	na	-	-	-	na	-	-	-	na	-	-	-	na	-	--	--	na	-
Isophorone <sup>c</sup>	0	-	--	--	na	9.6E+03	-	--	na	4.2E+05	-	--	na	9.6E+02	-	--	na	4.2E+04	-	--	na	4.2E+04
Kepone	0	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	-	
Lead	0	9.0E+01	1.0E+01	na	-	4.9E+02	6.4E+01	na	-	2.2E+01	2.5E+00	na	-	1.2E+02	1.6E+01	na	-	1.2E+02	1.6E+01	na	-	
Malathion	0	-	1.0E-01	na	-	-	6.3E-01	na	-	-	2.5E-02	na	-	-	1.6E-01	na	-	-	1.6E-01	na	-	
Manganese	0	-	--	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	
Mercury	0	1.4E+00	7.7E-01	--	--	7.7E+00	4.8E+00	--	--	3.5E-01	1.9E-01	--	--	1.9E+00	1.2E+00	--	--	1.9E+00	1.2E+00	--	--	
Methyl Bromide	0	-	--	--	na	1.5E+03	-	--	na	1.9E+04	-	--	na	1.5E+02	-	--	na	1.9E+03	--	--	na	1.9E+03
Methylene Chloride <sup>c</sup>	0	-	--	--	na	5.9E+03	-	--	na	2.6E+05	-	--	na	5.9E+02	-	--	na	2.6E+04	--	--	na	2.6E+04
Methoxychlor	0	-	3.0E-02	na	-	-	1.9E-01	na	-	-	7.5E-03	na	-	-	4.7E-02	na	--	--	4.7E-02	na	--	
Mirex	0	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	-	-	0.0E+00	na	--	--	0.0E+00	na	--	
Nickel	0	1.5E+02	1.7E+01	na	4.6E+03	8.3E+02	1.1E+02	na	5.8E+04	3.8E+01	4.2E+00	na	4.6E+02	2.1E+02	2.6E+01	na	5.8E+03	2.1E+02	2.6E+01	na	5.8E+03	
Nitrate (as N)	0	-	--	na	-	--	--	na	-	-	-	na	-	-	-	na	-	--	--	na	-	
Nitrobenzene	0	-	--	--	na	6.9E+02	-	--	na	8.6E+03	-	--	na	6.9E+01	-	--	na	8.6E+02	--	--	na	8.6E+02
N-Nitrosodimethylamine <sup>c</sup>	0	-	--	--	na	3.0E+01	-	--	na	1.3E+03	-	--	na	3.0E+00	-	--	na	1.3E+02	--	--	na	1.3E+02
N-Nitrosodiphenylamine <sup>c</sup>	0	-	--	--	na	6.0E+01	-	--	na	2.6E+03	-	--	na	6.0E+00	-	--	na	2.6E+02	--	--	na	2.6E+02
N-Nitrosodi-n-propylamine <sup>c</sup>	0	-	--	--	na	5.1E+00	-	--	na	2.2E+02	-	--	na	5.1E-01	-	--	na	2.2E+01	--	--	na	2.2E+01
Nonylphenol	0	2.8E+01	6.6E+00	-	-	1.5E+02	4.1E+01	na	-	7.0E+00	1.7E+00	-	-	3.9E+01	1.0E+01	-	-	3.9E+01	1.0E+01	na	--	
Parathion	0	6.5E-02	1.3E-02	na	-	3.6E-01	8.1E-02	na	-	1.6E-02	3.3E-03	na	-	9.0E-02	2.0E-02	na	-	9.0E-02	2.0E-02	na	--	
PCB Total <sup>c</sup>	0	-	1.4E-02	na	6.4E-04	-	8.8E-02	na	2.8E-02	-	3.5E-03	na	6.4E-05	-	2.2E-02	na	2.8E-03	-	2.2E-02	na	2.8E-03	
Pentachlorophenol <sup>c</sup>	0	6.4E+00	4.9E+00	na	3.0E+01	3.5E+01	3.1E+01	na	1.3E+03	1.6E+00	1.2E+00	na	3.0E+00	8.8E+00	7.7E+00	na	1.3E+02	8.8E+00	7.7E+00	na	1.3E+02	
Phenol	0	-	--	na	8.6E+05	-	--	na	1.1E+07	-	--	na	8.6E+04	-	--	na	1.1E+06	--	--	na	1.1E+06	
Pyrene	0	-	--	--	na	4.0E+03	-	--	na	5.0E+04	-	--	na	4.0E+02	-	--	na	5.0E+03	--	--	na	5.0E+03
Radionuclides	0	-	--	--	na	--	--	na	-	-	-	na	--	-	-	na	--	-	--	na	--	
Gross Alpha Activity (pCi/L)	0	-	--	--	na	-	-	na	-	-	-	na	-	-	-	na	-	-	--	na	--	
Beta and Photon Activity (mrem/yr)	0	-	--	--	na	-	-	na	-	-	-	na	-	-	-	na	-	-	--	na	--	
Radium 226 + 228 (pCi/L)	0	-	--	--	na	-	-	na	-	-	-	na	-	-	-	na	-	-	--	na	--	
Uranium (ug/l)	0	-	--	--	na	-	-	na	-	-	-	na	-	-	-	na	-	-	--	na	--	

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	1.1E+02	3.1E+01	na	5.3E+04	5.0E+00	1.3E+00	na	4.2E+02	2.6E+01	7.8E+00	na	5.3E+03	2.8E+01	7.8E+00	na	5.3E+03
Silver	0	2.4E+00	--	na	--	1.3E+01	--	na	--	5.9E-01	--	na	--	3.2E+00	--	na	--	3.2E+00	--	na	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,1,2,2-Tetrachloroethane <sup>c</sup>	0	--	--	na	4.0E+01	--	--	na	1.8E+03	--	--	na	4.0E+00	--	--	na	1.8E+02	--	--	na	1.8E+02
Tetrachloroethylene <sup>c</sup>	0	--	--	na	3.3E+01	--	--	na	1.4E+03	--	--	na	3.3E+00	--	--	na	1.4E+02	--	--	na	1.4E+02
Thallium	0	--	--	na	4.7E-01	--	--	na	5.9E+00	--	--	na	4.7E-02	--	--	na	5.9E-01	--	--	na	5.9E-01
Toluene	0	--	--	na	6.0E+03	--	--	na	7.5E+04	--	--	na	8.0E+02	--	--	na	7.5E+03	--	--	na	7.5E+03
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Toxaphene <sup>c</sup>	0	7.3E-01	2.0E-04	na	2.8E-03	4.0E+00	1.3E-03	na	1.2E-01	1.8E-01	5.0E-05	na	2.8E-04	1.0E+00	3.1E-04	na	1.2E-02	1.0E+00	3.1E-04	na	1.2E-02
Tributyltin	0	4.6E-01	7.2E-02	na	--	2.5E+00	4.5E-01	na	--	1.2E-01	1.8E-02	na	--	6.3E-01	1.1E-01	na	--	6.3E-01	1.1E-01	na	--
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	8.8E+02	--	--	na	7.0E+00	--	--	na	8.8E+01	--	--	na	8.8E+01
1,1,2-Trichloroethane <sup>c</sup>	0	--	--	na	1.6E+02	--	--	na	7.0E+03	--	--	na	1.6E+01	--	--	na	7.0E+02	--	--	na	7.0E+02
Trichloroethylene <sup>c</sup>	0	--	--	na	3.0E+02	--	--	na	1.3E+04	--	--	na	3.0E+01	--	--	na	1.3E+03	--	--	na	1.3E+03
2,4,6-Trichlorophenol <sup>c</sup>	0	--	--	na	2.4E+01	--	--	na	1.1E+03	--	--	na	2.4E+00	--	--	na	1.1E+02	--	--	na	1.1E+02
2-(2,4,5-Trichlorophenoxy)propanoic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Vinyl Chloride <sup>c</sup>	0	--	--	na	2.4E+01	--	--	na	1.1E+03	--	--	na	2.4E+00	--	--	na	1.1E+02	--	--	na	1.1E+02
Zinc	0	9.7E+01	9.8E+01	na	2.6E+04	5.3E+02	6.1E+02	na	3.3E+05	2.4E+01	2.4E+01	na	2.6E+03	1.3E+02	1.5E+02	na	3.3E+04	1.3E+02	1.5E+02	na	3.3E+04

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipal
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic  
= (0.1(WQC - background conc.) + background conc.) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	8.0E+02
Arsenic	1.4E+02
Barium	na
Cadmium	8.9E-01
Chromium III	5.8E+01
Chromium VI	8.8E+00
Copper	6.0E+00
Iron	na
Lead	9.6E+00
Manganese	na
Mercury	7.2E-01
Nickel	1.6E+01
Selenium	4.7E+00
Silver	1.3E+00
Zinc	5.3E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

MODOUT 0.0399 MGD.txt  
"Model Run For C:\Documents and Settings\pvu61777\My Documents\000\_kaharlow\Franklin County Commerce Center WWTP - VA0091103\VA0091103\_12\Technical\Regional Model - 0.0399 MGD - chronic ammonia.mod On 7/12/2012 1:28:46 PM"

"Model is for NORTH FORK OF LITTLE CHESTNUT CREEK."  
"Model starts at the FRANKLIN COUNTY COMMERCE CENTER WWTP discharge."

"Background Data"  
"7Q10", "cBOD5", "TKN", "DO", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.2068, 2, 0, 7.575, 22.3

"Discharge/Tributary Input Data for Segment 1"  
"Flow", "cBOD5", "TKN", "DO", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.0399, 30, 9, 6.4, 22.3

"Hydraulic Information for Segment 1"  
"Length", "Width", "Depth", "Velocity"  
"(mi)", "(ft)", "(ft)", "(ft/sec)"  
.308, 3.001, .18, .706

"Initial Mix Values for Segment 1"  
"Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.2467, 7.385, 16.321, 4.202, 8.418, 22.3

"Rate Constants for Segment 1. - (All units Per Day)"  
"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
1, 1.111, 17.532, 18.515, .25, .298, 0, 0

"Output for Segment 1"  
"Segment starts at FRANKLIN COUNTY COMMERCE CENTER WWTP"  
"Total", "Segm."  
"Dist.", "Dist.", "DO", "cBOD", "nBOD"  
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
0, 0, 7.385, 16.321, 4.202  
.1, .1, 7.384, 16.165, 4.191  
.2, .2, 7.384, 16.01, 4.18  
.308, .308, 7.386, 15.845, 4.168

"END OF FILE"

stats - TRC 0.0399.txt

7/12/2012 2:01:45 PM

Facility = Franklin Co Comm Ctr VA0091103  
Chemical = TRC  
Chronic averaging period = 4  
WLAA = 26  
WLAC = 17  
Q.L. = 100  
# samples/mo. = 30  
# samples/wk. = 8

Summary of Statistics:

# observations = 1  
Expected Value = 4000  
Variance = 5760000  
C.V. = 0.6  
97th percentile daily values = 9733.67  
97th percentile 4 day average = 6655.16  
97th percentile 30 day average= 4824.21  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 24.8637713289049  
Average Weekly limit = 14.8313660524016  
Average Monthly Limit = 12.3230112841717

The data are:

4000

Stats - Ammonia 0.0399.txt

7/12/2012 1:57:46 PM

Facility = Franklin Co Comm Ctr VA0091103  
Chemical = Ammonia  
Chronic averaging period = 30  
WLAA = 10.5  
WLAC = 2.8  
Q.L. = 0.2  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 1  
Expected Value = 9  
Variance = 29.16  
C.V. = 0.6  
97th percentile daily values = 21.9007  
97th percentile 4 day average = 14.9741  
97th percentile 30 day average= 10.8544  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 5.64947626156567  
Average Weekly Limit = 5.64947626156567  
Average Monthly Limit = 5.64947626156567

The data are: